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SANITARY SURVEY OF INDIANA INDUSTRIES EMPLOYING WOMAN LABOR

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By M. J. WHITE, Surgeon, United States Public Health Service.

A sanitary survey was made by the writer in compliance with instructions received from the Surgeon General. The work was done at the request of the commission on working women appointed by the governor of Indiana in accordance with the provisions of chapter 262, Indiana Acts of 1913,[1] for the purpose of investigating the hours and conditions of the labor of women.

The survey lasted from March 19 to April 25, 1914, and included 96 industries and trades, located in 13 different cities. They were selected by the commission, and their character is indicated in the list given below:

List and locations of industries and trades.

	Indianapolis.	Richmond.	Muncie.	Elwood.	Jonesboro.	Fort Wayne.	South Bend.	Chesterton.	Valparaiso.	Hammond.	Terre Haute.	Evansville.	Cannelton.
Laundries	3												
Textile mills	1	1				4							1
Tile factories	1												
Enamel factories											1		
Electrical supplies						1							
Metal trades	3		2	1			2						
Asbestos and mica factories								1	1				
Candy factories	2										1		
Cigar factories	1											1	
Garment trades	9					3	2				2	3	
Department stores	12					5	5				5	4	
Drug and instrument factories	1						1			1			
Cracker factories	1										1		
Box factories							2						
Soap factories						1							
Glass factories			1	1									
Rubber factories					1								
Book and catalogue factories										1			
Pottery factories												1	
Buggy factories												1	
Canning factories	3												
Bag factories	1												
Total	38	1	3	2	1	14	12	1	1	2	10	10	1

The sanitary survey of these places of employment related to the hygienic conditions under which females work and the data re-

[1] See p. 14.

corded follows the outline given in the letter of instructions sent by the Surgeon General, to wit:

(*a*) Location (section of town, relation to near-by structures).
(*b*) Construction (frame, brick, fireproof, etc.).
(*c*) Air space for employee.
(*d*) Provisions for ventilation.
(*e*) Illumination.
(*f*) Humidity and temperature.
(*g*) Drinking facilities.
(*h*) Toilet and washing facilities.
(*i*) Cloak, lunch, and rest rooms.
(*j*) Power machinery, including speeds, safeguards, foot treadles, and pressure necessary to operate the same.
(*k*) Provisions for fire exit, fire-extinguishing apparatus, and fire drill.
(*l*) Any other conditions having a direct or indirect influence on the hygiene of industries.

In regard to the physical examination of workers desired by the commission it was not practical, for the reasons hereinafter stated, to follow the given outline, to wit:

(*a*) Age, sex, race, nativity.
(*b*) Height, weight, circumference of chest.
(*c*) Capacity of lungs.
(*d*) Strength of forearm.
(*e*) Hemoglobin index.
(*f*) Blood pressure.
(*g*) Presence of special conditions, such as defective eyesight, defective teeth, flat foot, varicose veins, spinal curvatures, pelvic deformities, and the like.
(*h*) Presence of communicable diseases, such as trachoma and tuberculosis.
(*i*) The number of days lost by sickness by each person examined for a year past, and the nature of the affections causing them.
(*j*) Any additional points not covered by the foregoing.
(*k*) The effect on health of the employment of children.

The physical examination of employees offers several difficulties: Employers to whom the matter was mentioned made no objections to the examinations, but felt that they could not enforce submission to them, nor could they afford to pay employees while they were not working. Many employees do piecework, and their absence from duty would result in loss to themselves and to their employers. Again, the inconvenience and expense to the employees are important factors. As there are no suitable rooms in factories, stores, etc., where the examinations could be made, a woman, to be examined, would have to pay car fare to and from the office of the woman physician making the examination, and, for the purposes of the examination, remove much of her clothing. After the examination she might have to return to her home and change to her working clothes. The question of paying employees for their loss of time from work was duly considered, and, in view of all the circumstances

it was decided to make such observations on the physical status of employees as might be practicable during sanitary inspections of places of employment. And this was done with the following results:

Females engaged in work requiring a good deal of muscular exercise were, as a rule, robust, well nourished, and presented no noticeable facial aspect of worry or overfatigue. The action, the exertion, and attention necessitated by such work would appear to be beneficial. Such workers were noticed among those engaged in the inspection of tin plate, enamel dipping, buggy upholstering, core makers, machinery operators in laundries, textile mills, iron factories, and other occupations requiring standing and moving about sufficiently to cause active muscular exercise.

Females whose occupations required sitting at work, but entailing frequent muscular exercise of the torso and upper extremities, such as garment workers operating sewing machines, were, as a rule, well nourished but anemic in appearance and seemingly were less contented and strong than those whose entire musculature received active exercise. Females, either standing or sitting most of the time, whose duties required no very active muscular exercise, such as clerks, clerical workers, seamstresses, and milliners in department stores and the like appeared physically less fit than the other classes mentioned. The most dejected workers noticed were among the candy, crackers, and paper box makers.

As a whole, however, none of the workers observed as a class appeared to be in particularly poor physical condition. The only probable disposition to mechanic's palsy was noticed among girls engaged in glove turning. These machines are operated by frequent movement of the right leg, which was continuous, being kept up while the operator picked up gloves to be placed in the machines. A somewhat similar condition was observed among the burring machine operators, whose left arm had to be frequently used in operating a lever, and in those engaged in rubber stamping china plates.

I noticed 8 or 10 girls in whom I would suspect tuberculosis, but they were not coughing; 3 in whom I would suspect trachoma; and 1, a typesetter, in whom I would suspect lead poisoning. The tendency to eye strain was most noticeable among operators of sewing machines in garment manufacturing, the use of eyeglasses being not uncommon.

The details of the inspections of the various establishments will be found in the appendix on p. 15.

Recommendations.

Section 3 of the act creating the "commission on working women" provides, first, that the commission shall investigate the hours and

conditions of labor of women in this State; second, that it shall determine what limitation, if any, should be placed on the hours of labor of women in any and all employments; third, that it shall determine what improvements should be made in the conditions under which women labor in any and all employments.

My sanitary survey and intensive study of the industries selected by the commission indicate the desirability of certain improvements in the hygienic conditions under which women work, and these are given below:

Ventilation, Heating, and Humidity.

Section 15 of the Indiana act approved March 2, 1899, Chapter CXLII, relates to the air space and "sufficient means of ventilation" in each workroom of every manufacturing or mercantile establishment, etc. It is desirable not only to have the sufficient means of ventilation, but to require that such means be used, and that proper atmosphere be provided in all parts of the workrooms during working hours and in such manner as not to expose any worker to drafts therefrom. The means are useless unless operated. Ordinarily, windows are good means of ventilation, but adequate ventilation can not be effected by such means if the windows are kept closed, nor can their use effect proper ventilation in all parts of large workrooms without exposing some workers to drafts or to too low temperatures. Where large fans are used for the purpose of effecting ventilation by exhausting or drawing atmosphere out of the workrooms, there are likely to be pockets of close atmosphere in the corners of the rooms and in partitioned-off spaces, unless the fans are suitably located or supplemented by conduits adequately arranged. Where large fans are used to force fresh air into the workroom, conduits should be provided for distributing the air to all parts of the room, instead of admitting it only at a few large inlets in one end of the room, for this method of distribution entails exposure to drafts. Fresh-air conduits running the length of the room and located well above the heads of workers, and provided with numerous small outlet flues on their upper surface would effect proper distribution without drafts. Where air is forced into the workroom, especially in large cities, where the lower strata of the atmosphere are usually laden with street dust and bacteria, it should not be taken from sidewalk pits, alleys, or from other workrooms, but preferably from a suitable point on or near the roof of the building. Fresh air should not be forced in through inlets placed in the floor of the workroom, unless such inlets are adequately protected from floor sweepings and dust. Preliminary filtration of fresh air for the purpose of removing dust is desirable. The most effectual methods of ventilation are those that can be oper-

ated in spite of and without the assistance of the occupants of the room.

Proper degrees of humidity and temperature should be provided in all parts of the workroom, and the temperature, for reasons of economy as well as hygiene, should be controlled by thermoregulators. Where cold outside air is heated and forced into the workrooms without having been suitably moistened, it will absorb moisture from articles in the room, such as furniture, cloth, leather goods, etc., as well as from the skin and the mucous membranes of the eyes, nose, and throats of the occupants. The resultant dryness tends to produce discomfort, irritation, and discontent of workers, who are, in consequence, apt to become more easily fatigued and more promptly inattentive to business. This drying out of goods, such as knitted underwear, hosiery, flannels, rugs, etc., increases their tendency to give off lint and sizing when being handled by clerks and shoppers. While the amount of such substances given off is small, the constant exposure to it is undesirable. A suitable degree of humidity should be required in workrooms, no matter what system of heating is used.

Where workrooms are heated by stoves, jacketed ventilating stoves should be required in place of the ordinary type, which is prone to overheat not only the workers who sit near them, but the entire room as well, and, in consequence, so lower the humidity of the atmosphere that discomfort results. Suitable heat deflectors and water holders of adequate capacity, when actually used in connection with the ordinary coal stoves, would tend to lessen the objectionable features, provided the stoves are not kept red hot and fume producing. One reason why so many workers are not comfortably warm in a temperature of from 70° to 72° F. is because the relative humidity is too low. It should be from 50 to 55 at such temperatures. If so maintained it will effect economy in coal consumption as well as increased efficiency of the workers. It is good business to keep down the coal bill by the thermoregulation of heat and by supplying suitable humidity for the purpose of promoting the comfort and efficiency of workers. This feature of industrial hygiene is indicative, for when employers and employees fully realize the practical value of maintaining good hygienic conditions in workrooms, the medical officer of health will not only find the enforcement of existing laws and regulations very much easier, but he will find decidedly less opposition to new legislation.

High degrees of humidity and temperature, which exist in laundries, canning and packing establishments, candy factories, lamp-chimney works, etc., when not essential to the actual process of manufacture and are avoidable, should be prevented by the use of adequate heat deflectors, exhaust hoods, etc., so arranged and oper-

ated as to take up the heat or steam at the points of origin, instead of permitting them to escape into the workroom. Although large exhaust fans may be placed in the walls to reduce the temperature and humidity, they can only do so while the workers are exposed to the harmful effects of these enervating conditions.

Large roof monitors are excellent means of removing such steam and heat from workrooms. Not only should sufficient means be provided for this purpose, but such means should be effectually used during the entire time employees are at work. Periodic use is insufficient. In certain industries the processes of manufacture require unusual degrees of humidity and temperature in the workroom. This is essential, and where due regard is paid to the proper regulation of the temperature, the humidity and the ventilation in such places, the atmospheric conditions are as good as it is practical to make them. The temperature and ventilation, as well as the humidity, should be adequately regulated during the entire time of work. If only the degree of humidity required by the process is supplied, and no attention is paid to the temperature and ventilation of the workroom, enervating conditions are very apt to arise. Where high relative humidity is required, the atmosphere should be kept moving by artificial means, especially in hot weather.

Ventilation, temperature, and humidity go hand in hand, and the needed improvements in the hygienic conditions under which women labor can not be maintained without due regard to each of these three factors.

Lighting.

Where workers, such as sewing-machine operators, knitters, and watchmakers, are required to face windows continually, their eyes should be protected from the glare of strong daylight by the use of window curtains, which tend to more evenly distribute the light. Where the use of such curtains is impracticable, eye shades should be used. The exposure of such workers to direct sunlight should be avoided by the use of window awnings or shades. Where electric lamps are supplied for concentrating light on the work, as is common in the use of sewing machines, the eyes of the workers should be protected not only from the glare of the light, but from its heat as well. Such lamps are usually dropped from the ceiling and equipped with green shades, but hang near the operator's head. The adjustable lamp attached to the worktable not only illuminates the desired part of the sewing machine better than the drop-light, but being further removed from the operator's face and green-shaded, does not heat the eyes.

Workrooms should be high studded in order to admit as much daylight as possible, and the walls and ceilings should be kept clean and white. Workrooms that are poorly supplied with daylight

should be provided with window prisms for the purpose of admitting more daylight. Attractive workrooms are useful and desirable.

The indirect system of artificial lighting seems to be the best for women doing clerical work in offices and would be easier on clerks in department stores that require the use of artificial light during the entire day. Here, however, the frosted lamps suspended from the ceiling seem to provide the best light for shoppers.

Dust, Fumes, Etc.

Section 9 of the aforementioned act requires that "Exhaust fans of sufficient power shall be provided for the purpose of carrying off dust from emery wheels and grindstones and dust-creating machinery from establishments where used." This should be amended so as to enforce, wherever practicable, the constant and effectual use of such fans in conjunction with properly constructed hoods so placed as to remove the dust at its source, instead of allowing it to escape into the workroom, and by requiring that it be discharged in such manner as will not bring it in contact with workers in any other part of the place of employment or with workers in any other place of employment. A similar provision should be required for protecting workers from lint, odors, fumes, gases, or other substances resulting from the work required to be done; but where it is impracticable to maintain this removal-at-the-source system, the use of large exhaust fans, ceiling ventilators, etc., should be required wherever the process of manufacture admits, for the purpose of diminishing as much as possible the amount of objectionable substances in the air.

In respect to lint. The prevention of the "fly" of textile mills, as well as the dyed lint created by sewing machines used in the garment trades, is a problem that needs to be solved by experimentation. This problem should receive the attention of designers of lint-producing machinery. Such lint is said to be salable, and its collection for that purpose would be desirable, and for hygenic purposes, most desirable. This is another instance of the close affiliation of good business administration and public health work. Here hygienic betterment is of the greater value, and if sanitarians can prevail on designers of machinery to improve their machines appropriately, the practical value to all concerned would be great.

Fire-Escape Facilities.

Improvement in the facilities for escape from basements seems to be very desirable. In garment factories where the line of shafting beneath the sewing machines is permitted to cross the aisles leading to the fire escapes, it forms probable tripping obstructions, in case of

a rush for the fire escapes. Unless some one has presence of mind enough to shut off the electric power, there would appear to be danger, in case of stumbling over these obstructions, of some one being caught in the revolving shafting. Some method of easily shutting off the electric power should be installed. In large places of employment it would be very desirable to require an inside system of alarm, which would not only summon the city fire department, but would alarm each room in the building and, if possible, automatically shut off the power. A weekly fire drill should be required in all places where any number of women are employed. The practice common in department stores of using balconies for offices, and of partitioning off spaces from the salesroom for use as repair departments, alteration departments, millinery departments, etc., should be regulated by requiring not less than two suitable exits from such places, as the fire might happen to block the only exit.

In workrooms, where long lines of sewing machines are used, the tables are about 4 feet wide and are separated by aisles about 6 feet wide. Ordinarily, each aisle is encroached upon by two rows of chairs and workboxes used by the operators. This leaves about 18 inches of free space between the two rows of chairs and workboxes. In case of a rush for the fire escapes, it is altogether likely that the entire aisle would be even more obstructed. The need of weekly fire drills is obvious.

Overfatigue.

The conditions under which many women work are calculated to cause overfatigue, particularly so in the case of novices, while they are becoming accustomed to the work. Where the hygienic conditions are not good, overfatigue is far more apt to develop than where the hygienic conditions are favorable. Provisions should be made by which employees engaged in hard work, particularly novices, should be permitted to stop occasionally during working hours for the purpose of resting, and there should be suitable places conveniently located where such rest could be had. Section 10 of the aforementioned act provides for the use of seats "when she is not necessarily engaged in the active duties for which she is employed, etc."

Where women have to stand at their work, the condition of the floor should be suitable. A cement, brick, or stone floor is particularly trying to the standing worker, and is a potent factor in producing overfatigue. Women engaged in work that requires very rapid and constant muscular exercise of a particular group of muscles are exposed to the danger of developing mechanic's palsy. Such exercise is required in operating glove-turning machines, burring machines, and in the rubber stamping of chinaware. This is especially so among telegraphers. Women who are engaged in the

preparation of certain drugs are liable to be injuriously affected. Those who are apt to develop mechanic's palsy and those who are subjected to dangerous absorption of certain drugs should be forbidden by law to work at such immediately any unfavorable symptoms appear. This same general provision should be made to apply to all trades where their is intrinsic danger, especially where lead, mercury, phosphorus, arsenic, nitrobenzol, naphtha, etc., are used in the work. It would be highly desirable to amend section 2 of the aforementioned act by requiring medical supervision of females engaged in the so-called dangerous trades, and to regulate the employment of minors in such trades, as is done by the State of Massachusetts. Medical supervision of females engaged in work calculated to produce eye strain is also desirable.

Working Dress.

Where women and girls are required to wear uniform, such uniform should be comfortable, and no part of it, such as a high, stiff collar, which is uncomfortable and hot in summer, and likely to exert undue pressure on the neck, should be permitted. It would be desirable for women engaged in the dusty and dirty trades to wear work aprons for the protection of their clothing. These aprons should be required to be kept clean for the purpose of promoting personal hygiene of the wearers. This would tend to make them more careful in the manner of performing their work, provided they are required to supply the clean aprons. (See Sanitary Survey Report on Tile Workers.)

The laws controlling sanitation in food-producing establishments apply in part.

Protection Against Accidents.

The provisions of the present law appear to be adequate in so far as they apply to safeguards on machinery. In the button-clamping machines used in overall factories, women are said to be in the habit of using their fingers to remove impacted buttons from the machine, instead of using the steel pick supplied for that purpose. While so engaged some of them are said to have thoughtlessly applied the power to the machine, with the result of clamping buttons on their fingers.

In case of injury or sudden illness, there should be a suitable room adequately equipped for supplying first-aid relief, and the forelady, foreman, and factory manager should be conversant with the methods of giving such aid. Women working at counters located near the swing-door entrances of stores should be protected from drafts, and not required to wear sweaters in the hopes of guarding against the dangers of the draft.

Industrial Noise.

While this is calculated to exert a probable influence in the development of neurasthenia, it appears at present to be unavoidable, unless designers of machinery can accomplish noiseless or less noisy types. Industrial strain and industrial monotony can be materially lessened by maintaining good hygenic conditions under which women work. The so-called over specialization of industries seems to make it impracticable to change the work of women from time to time, so that by giving them a variety of work in the same factory the strain and monotony of any particular specialty will be avoided. The piecework system would prevent this in all probability.

Recreation, Rest, and Exercise.

Whatever the method of work, whether the piecework system, the hour or "time" system, or the flat-salary system, the hygienic demand is that sufficient opportunity should be had by each employee for the purpose of obtaining recreation and outdoor exercise by daylight. Early hours of work necessitate early rising and the attendant likelihood of too frequently bolting an insufficient breakfast in order to reach the place of employment on time. On the other hand, when the hours of work are not over until late, women are frequently not able to reach their homes before dark.

It is regrettable that the State can not enforce, as a condition of employment, a daily "work-out" for the sedentary and others engaged in the nonappetite-producing occupations.

Cloak Room, Lunch Room, Rest Room, Washing, Drinking, and Toilet Facilities.

Section 10 of the aforementioned act might well be amended by requiring the use of individual drinking cups and towels and the providing of liquid soap instead of the bar of soap for common use. Washing in running water only is far preferable to the use in common of wash bowls. All washing facilities should be large enough to permit of prompt use by all employees. If a woman has to wait half her lunch hour before she can get a chance to wash her face and hands, she is likely to omit the process. The result may be contamination of her food with textile dyes, etc.

General sanitary conditions should be maintained in all facilities as required by this section of the law and by section 5 of the act approved March 8, 1909, chapter 163. This act confers powers on the State board of health to enforce sanitation and favorable hygienic conditions in certain industries, and to make inspections (physical examinations) to detect diseased persons. The extension of this act to include all industries would be desirable.

While the general sanitary conditions of most of the water-closets inspected were fair, such conditions could be improved by the constant attention of the janitress, who could also prevent "loafing" in such places. The State laws cited, however, adequately provide for the proper sanitation, location, and number of water-closets, etc.

Whether the not uncommon practice of water-closet "loafing or visiting" is due to late hours or loss of sleep the night before, or to the fact that the atmosphere being less dry than that of the workrooms is more comfortable, or to the more convenient location where needed temporary rest can be obtained, although not provided for or allowed during working hours, is problematical.

It would be desirable for rest rooms to be supplied with a reasonable number of cane-top or sanitary lounges and rocking chairs. Where lockers are provided for cloaks, they should be kept free from rubbish and insects.

Water Supply.

Some of the places inspected use water from the city supply, while others had their own driven wells. I made it a practice to partake of the water and, with the exception of its hardness, no objectionable conditions were noted. The water used for washing purposes, as well as for drinking, should be officially approved. If the source of water is unfit or dangerous for drinking purposes, it is dangerous and unfit for washing purposes.

Home Hygiene.

While considerable attention is being given to industrial hygiene and the conditions under which women work, we should not lose sight of the fact that both personal and home hygiene are extremely important factors in maintaining physical fitness, and that the several conditions of work are by no means altogether responsible for the poor physical conditions of many workers. It is likely that the general hygienic conditions in the several places of employment inspected, with but few exceptions, would compare favorably with the hygienic conditions in the homes of those employees whose physical conditions are below par. As a rule, the disposition of employers is to provide hygienic betterment in their stores and factories. However, there is room for improvement, and this can be expedited by appropriately educating employers and employees. Legislation unquestionably is necessary and desirable, but why is it not more adequately observed? One reason is that so many employers do not fully appreciate the practical value of good hygienic conditions in promoting the efficiency of their employees. Another is that so many employees, being accustomed to overheated and vitiated atmosphere in their homes, oppose the existence of different conditions in their places of employment.

APPENDIX.

Commission on Working Women.

(Acts of 1913, chapter 262.)

An Act To provide an investigation of the hours and conditions of labor of women.

SECTION 1. *Be it enacted by the General Assembly of the State of Indiana*, That the governor shall, within 30 days after this act takes effect, appoint a suitable commission of five persons, at least one of whom shall be an employer, one an employee, and one a woman.

SEC. 2. The members of the commission shall serve without compensation, but shall be allowed their necessary traveling and hotel expenses while attending to the business of the commission, to be paid on warrants approved by the chairman of the commission.

The commission shall organize within 30 days after their appointment by electing a chairman.

The commission may appoint a secretary either from within or without the public service of Indiana and allow such compensation, or if appointed within the public service such additional compensation as the commission shall determine. All necessary expenses of the secretary in connection with the business of the commission shall be allowed and paid in the same manner as prescribed for the payment of expenses of the commission.

SEC. 3. The commission shall investigate the hours and conditions of labor of women in this State and shall determine what limitation, if any, should be placed on the hours of labor of women in any or all employments, or what improvement should be made in the conditions under which women labor in any or all employments. The commission shall hold hearings in at least ten different communities of the State and invite the testimony of interested parties and experts.

The commission shall have the power to compel the attendance and testimony of witnesses and the production of books and papers necessary to its investigation, and shall have the right to enter any establishment where women are employed for the purpose of making their investigation.

SEC. 4. The sum of $2,000 is hereby appropriated, to be available after May 1, 1913, and during the life of the commission, for the purpose of carrying out the provisions of this act. The report of the commission shall be printed by the commissioners of the public printing, binding, and stationery.

Personnel of the Commission.

(1) Harry E. Grube, chairman, Plymouth, Ind.
(2) Melville W. Mix, Mishawaka, Ind.
(3) Lee Rodman, Cannelton, Ind.
(4) H. J. Conway, La Fayette, Ind.
(5) Bertha Greene Lockwood, Indianapolis, Ind.
Mae Romig Miller, secretary, South Bend, Ind.

Reports on Individual Establishments.

I. Manufacturer of ladies' shirt waists, located in a four-story brick building, with good surroundings. The air space on the fourth floor where 200 girls are working is approximately 1,000 cubic feet per employee. The provisions for ventilation are by windows and doors alone. Electric drop-lights are placed over each machine. The sanitary conditions of the drinking, washing, toilet, and cloak-room facilities are fair. The cloak, lunch, and rest rooms are partitioned off from the main workroom, which is high studded and the partition being about 7 feet high. Electric power is used for all machinery. The speed and foot treadles are easily operated, and the long lines of shafting running beneath the sewing machines are protected by horizontally placed guard boards about 6 inches wide. At the rear of the building is a fire tower, with entrance doors opening onto outside iron porches. The escape from the front of the building is down the narrow, inside stairway, which is used by employees in going to and from work. The approach to the fire tower is not obstructed, but the approach to the narrow stairway in front is obstructed by the partition which makes the lunch room, the door in this partition being locked. Fire extinguishers are kept in the workrooms. At the time of my inspection the fourth-floor workroom was quite warm, and the odor of perspiration was noticeable in the north end of it. These employees have the very common and pernicious habit of keeping the room hot and stuffy. The forelady informed me that the girls insisted on keeping the windows closed in cold weather. The direct system of heating by steam radiators is used, but it is not controlled by thermo regulators. On the third floor fifteen girls work, and the sanitary conditions are fairly good, as was the case in the executive offices on the second floor. The ground floor was occupied by a store.

II. *Garment factory.*—This is a small place occupying the first floor of an old residence. The surroundings are fair. The air space per employee is about 600 cubic feet. Adequate ventilation by windows is possible but not actual. Electric lights are dropped over each machine, and the machines are motor driven. The sanitary conditions of the toilet, washing, and drinking facilities are fair. The line of shafting beneath the sewing machines is protected by a wooden casing. Windows and doors are available for fire escape. The general workroom is used as a cloak, lunch, and rest room. The temperature and humidity did not appear excessive, and there were no disagreeable odors. The place manufactures women's garments.

III. *Manufacturer of overalls.*—This is located in a four-story brick building, with good surroundings. The fourth-story workroom has about 630 cubic feet of air space per employee, and the third-story workroom about 1,000 cubic feet per employee. Provisions for ventilation consist of windows, doors, elevator shafts, and stairways. Electricity is used for lighting and for machinery. A green-shaded drop-light is hung over each sewing machine. The sanitary conditions of the toilet, washing, drinking, and cloak room facilities are good, and of the lunch room very good. There are two outside iron fire escapes with doorway approaches, and a good sprinkler system is installed. This outside fire escape passes across the windows in its course. On the first floor there are inside fire-alarm boxes. In the rear of the building the fire tower extends to and includes the basement, and the entrances to it from the workroom are guarded by fire-retarding doors. There is also a stairway in the front of the building. There is no fire drill. The line of shafting beneath the sewing machines is protected by 6-inch guard boards, and the electric power is controlled by wall switches.

IV. *Manufacturer of men's garments.*—This is a new reinforced-concrete building, with good surroundings and large windows. The building resembles the type of the modern automobile factory building. The air space per employee in the several workrooms varies from 475 to 700 cubic feet per employee, and the plenum method of ventilation is installed. The direct steam-heating system is not controlled by thermoregulators. Bubbling drinking cups are in use, and the sanitary conditions of the lunch, rest, cloak, washing, and toilet facilities are good. Shaded electric drop-lights are hung over each sewing machine. All machinery is motor driven. Adequate fire escapes are provided and a good sprinkler system.

V. *Manufacturer of gloves.*—The surroundings of this four-story brick building are good. The air space per employee on the second floor is about 2,600 cubic feet, and on the third about 700 cubic feet, and on the fourth about 1,400 cubic feet. The sanitary conditions of the toilet, drinking, washing, cloak room and rest-room facilities are good. Windows, doors, stairways, and the elevator shaft constitute the means for ventilation, but, as is customary, very few, if any, of the windows are kept open in cold weather. The workrooms are high studded and electric lighted and steam heated, and the machinery is power driven, except in the case of the glove-turning machines, which are operated by a pedal so placed as to always necessitate the use of the right foot and leg. The pressure necessary to operate these pedals is, however, small. The external fire escape is easily reached through doorways. The sewing on canton flannel used in the manufacture of gloves causes considerable lint in the atmosphere of the workroom, and a noticeable accumulation of it on the floors. The machines used in this work have no hoods nor exhaust fans for removing this lint. There are no inside fire-alarm boxes, but fire extinguishers are kept in the workroom. Each sewing machine is lighted by an electric lamp attached to the work benches, so that the space in the upper part of the room is not obstructed by numerous dust-collecting electric wires. The windows are provided with thin cotton-sheeting curtains for the purpose of more evenly distributing daylight.

VI. *Manufacturer of overalls.*—This is located in an old one-story brick building, with fairly good surroundings. The air space per employee is about 900 cubic feet. Windows and skylights are used for ventilation, but not adequately so. The sewing machines are lighted by shaded electric drop-lights, and the machinery is driven by electricity. Two coal stoves are used for heating this room, which was quite warm, and particularly so for the operators sitting near them. The toilet and washing facilities are bad, being located in a dirty and dark corner of the workroom. There is no cloak, lunch, nor rest room. The place is overheated and poorly ventilated, and the women workers at the sewing machines seemed to be uncomfortable. This place needs special attention.

VII. *Manufacturers of overalls and shirts.*—This is a three-story brick building, and has good surroundings. The air space on the third-floor workroom is about 192 cubic feet per employee, and on the second floor about 745 cubic feet. The place is steam heated and overheated, and the only provision for ventilation is by windows and doors. Bubbling drinking cups are provided. Toilet and washing, cloak, lunch, and rest room facilities are but fair. Electricity is used for lighting and machinery power. Safeguards, speeds, and foot treadles are similar to those in other factories described. There are no special fire escapes and no fire drill. All of these factories have circular desk fans at the end of each workbench for use in hot weather only.

VIII. *Manufacturers of overalls.*—This is located on the second floor of the Industrial Building on West Tenth and Canal Streets. It is a large brick

building, in which there are several factories. The air space per employee is 720 cubic feet. Windows constitute the provision for ventilation. The room is steam heated and the sewing machines are supplied with electric drop-lights. The common cup is used for drinking purposes. The toilet and washing facilities are but fair, and the cloaks of the workers are hung on nails in this room. There are no lunch nor rest rooms in this factory, but there is a lunch room in the building. There are two outside fire escapes but no fire drill. There is a sprinkler system. The lines of shafting below the sewing machines are not guarded as in the other factories except where they cross the aisles.

IX. *Garment manufacturer.*—This is located on the third floor of the Industrial Building, and provides about 1,000 cubic feet of air space per employee. Windows are used for ventilation. There are circular fans on each row of sewing machines for use in hot weather. Individual cups are said to be supplied for drinking purposes, and there are fair facilities for toilet, washing, and cloakrooms. There is no lunch room in the factory proper. The rest room is small, but good and attractive. There are two outside fire escapes, but the shafting, as in other factories, form obstructions in the aisles that lead to the fire-escape approaches. Here, as in other similar factories, the electric power for driving the machinery is controlled by a switch placed at the end of the room. The factory manager, who seems to take particular interest in the welfare of those working under him, has devised a simple method of shutting off the electric power in case of accidents. This consists in a line of rope running the length of each row of sewing machines and connected with the electric switch at the end of the room. By pulling these ropes, which are in easy reach, the power can be shut off immediately. This seems to be a very excellent precaution in case of accidents, as any operator could stop the power without moving more than two or three feet. This factory manager keeps on hand antiseptic dressings and a few medicines for first-aid relief of sick or injured employees.

X. *Candy factory.*—This is located in a brick building in fairly good surroundings. The air space per employee is about 1,000 cubic feet. There are facilities for electric-driven fans to force air into the building and to distribute it over the work tables through galvanized iron conduits. This appears to be a good system when in operation. There are no exhaust fans for ventilation, but such could be used to good purpose in lessening the odors of candy and removing the steam that escapes from the vats. Electricity is used for lighting and driving the machinery. The workrooms are warm and humid. The toilet, washing, cloak, and rest-room facilities are poor. There appear to be sufficient safeguards on the machines. There are no fire escapes except by passing through doorways leading from one part of the factory to another and to the regular stairways used by employees in going to and from work. There is no fire drill. In the basement, where men work at pulverizing sugar, etc., by machinery, there is a considerable amount of very fine dust, some of which passes up the elevator shaft to the rooms where women work. The factory manager stated that this dust was not known to explode, but its proper removal from the building should be enforced.

XI. *Manufacturer of malleable castings.*—This is a large brick building, in good surroundings. The air space per employee is ample. Ventilation is by windows and doors. Bubbling drinking cups are installed. There are no lunch nor rest rooms. Toilet and washing facilities and cloakrooms are fair. Electricity is used for lighting and driving machinery. The foot treadles and speeds are easily operated and the machinery is safeguarded as much as practicable. Burring machines are operated by a hand lever and so placed as to

necessitate the use of the left arm at all times and almost constantly, while the right hand of the operator is used in feeding the machines. The emery wheels used for polishing are guarded in part. Some of the women wear glasses to protect their eyes from dust, while others refuse to do so, claiming that the use of glasses produces headache. There is no downward suction by exhaust fans to remove the dust created by this process. In the shaping of iron cuffs, a milky white "cutting" solution is used, and this gets on the hands of the girls removing the cuffs from the tubs containing the solution. I could not ascertain the composition of this solution, but it is said to be harmless. While the operation of the arm lever of the burring machines would appear to be capable of producing mechanic's palsy, it is said that no ill effects have ever been noticed. The position of the operator, however, is quite cramped. The odors from the furnaces pervade the room in which women are making cores. An effort is made to collect the escaping gases by large iron hoods placed above the doors of the furnaces and connected with the chimneys. The factory manager stated that formerly exhaust fans were used for removing these gases, but that he had found the present arrangement more effective. This arrangement, however, is inadequate.

XII. *Candy factory.*—Located in a brick building, in fairly good surroundings. The air space per employee is about 700 cubic feet. Ventilation is effected through windows, most of which were closed. The air in the rooms where the candy is cooked is quite moist from escaping steam, and the usual candy-factory odors were strong. The temperature of the room was rather high. The floors were dirty. The common cup was used for drinking purposes. The toilet and washing facilities were bad. There are no cloak, lunch, nor rest rooms. Electricity is used for lighting and driving machinery. The approach to the one outside fire escape is through a closed window. A long table placed in front of this window obstructs this approach. In this, as in the other candy factories, girls are said not to push the trucks loaded with candy trays, this duty being given to boys.

XIII. *Drug company.*—This is located in a large brick building, in good surroundings. The air space per employee varies from 800 to 1,500 cubic feet. Ventilation is through windows. Electricity is used for lighting and driving machinery. The toilet and washing facilites and cloak, lunch, and rest rooms are fair. There is a small sick bay suitably equipped. The rooms are high studded, well painted, and kept clean. There is no fire drill nor outside fire escapes, but all of the rooms are connected by wide doors. In the rooms where hypodermic tablets are made and where quinine capsules are filled, there is appreciable dust from the several drugs used. The use of exhaust fans for removing the dust is said to be impracticable. The policy of the management is to remove from these rooms any girl who shows an idiosyncrasy for the drugs and place her at work in some other part of the factory. There have recently been installed in some of the rooms exhaust working plates for removing dust produced in handling compressed tablets. The handling of bichloride of mercury occasionally causes dermatitis and rarely systemic poison. The management, however, seeks to safeguard employees from such dangers as much as practicable.

XIV. *Chain factory.*—This is located in a large brick building, which provides an air space per employee of about 800 cubic feet. Ventilation is by windows. Electricity is used for lighting and driving machinery. Toilet, washing, and drinking facilities are fair. There are no lunch nor rest rooms. Cloaks are hung on racks in the workroom. The machinery is duly safeguarded from accidents and is operated with little difficulty. In making certain parts of the chains, the girls use hammers frequently, but none of them

appear to have developed mechanic's palsy. There are no special outside fire escapes, but wide doors connect the several parts of the factory. The windows on the ground floor have heavy wire screens fastened over them. Where the oiled links are cleaned in a boiling sode solution, there is considerable steam given off, which permeates the workroom, there being no hoods with exhaust fans to prevent this. The noise in this factory is considerable and unavoidable. The workrooms are large, high studded, and kept in fairly good condition.

XV. *Tile factory.*—This is located in a brick building, which provides about 700 cubic feet of air space per employee. Ventilation is provided by windows. Electricity is used for lighting and driving machinery. Inverted faucets are used for drinking purposes. There are no cloak, lunch, nor rest rooms. The toilet and washing facilities are fair. There are no outside fire escapes nor fire drill. Tile-pressing machines are operated by hand and by men, but the press tile is sand papered and dusted off by girls, who sit at their work. The dust from this operation is considerable, and there are no exhaust fans nor hoods under which this work could be done. The girls are in the habit of brushing the dust in their laps instead of away from them, as the pressed tile is held between their bodies and the stands in which the hair brushes are kept, so that as the brush is picked up, it is first brought toward them across the tile, which removes most of the dust. The sharp edges of the tiles that have been baked necessitate the use of rubber or cloth finger guards to prevent abrasions of the skin. Some of the women handling tiles wrap their hands heavily with old cloths to prevent abrasions of the skin. The tiles are given a coating of liquid glaze and then placed in the covered suction hoods before the powdered glaze containing litharge is placed on them. This hood appears to remove the very fine powdered glaze dust from the room. The odors from the furnaces do not appear to reach the rooms in which the girls work. The principle source of danger to them is the dust resulting from cleaning and brushing freshly pressed tile. This work is done by men in the same room where the women handle baked tile.

XVI. *Bleaching company.*—Located in a large brick building on the White River, in good surroundings. The spinning, carding, and weaving rooms are very large and high studded, and provide ample air space per employee. The factory manufactures cotton goods. There is considerable noise from the machinery, and floating lint in the workrooms. Ventilation is provided for by windows, but they were kept tightly closed in order that the necessary humidity required in the several processes may be maintained. Steam is constantly discharged into the rooms for this purpose, and for the additional purpose, the factory manager stated, for offsetting the effects of static electricity produced by the belts. The temperature appeared to be unnecessarily high. The floors are kept fairly clean during working hours by sweeping them with an ordinary broom. There are no fire escapes on the outside of these buildings, the doors and stairways used daily by the employees in going to and from work being used for such purposes. The machinery appears to be safeguarded from accidents as much as practicable. The spinning room is lighted by electricity, and the light is evenly distributed. In the other workrooms the Cooper-Hewitt light was used. Bubbling cups are supplied for drinking purposes, and cloaks are hung on pegs in small spaces partitioned off from the workrooms. The sanitary conditions of the washing and toilet rooms are fair, but the rooms are small. The workrooms are high studded and well painted, and the windows provide sufficient daylight. In the carding room painters were at work along with the factory employees, and, as the windows were tightly closed, the odor of paint was pronounced. The heating system consists of hot air which enters through registers placed in the floor of the workroom.

There is a good fire-sprinkler system installed. The machinery is driven by electricity and controlled by switches in each workroom. Steam that escapes from the sizing room, in which only men work, invades the adjoining rooms where women work, and there is no exhaust system for removing this steam at its point of origin. The few machines that require occasional muscular power are so arranged that but little exertion on the part of the women is necessary. When these automatic machines are working, the operators have very little to do. There are no devices for regulating the temperature and humidity in these workrooms, except that experience has shown that sufficient humidity can be maintained by allowing steam to escape constantly from an open pipe. Humidifiers are hung near the ceiling in these rooms for use, it is said, in summer in place of the escaping steam. While it would appear that accurate control of the heat and humidity would be desirable, I noticed no seeming enervation on the part of the women operators working under this guesswork system. Fire extinguishers are hung in all the workrooms.

XVII. *Packing company.*—This is located in large brick buildings, in fairly good surroundings. The bacon room provides an air space of about 500 cubic feet per employee, and is kept at a temperature of between 48° and 56° F. by the use of electric fans that force cold air into the room, and by the use of exhaust fans. Ozone is liberated in this room as a "sweetener." The trimming department provides about 650 cubic feet of air space per employee. Outside air is forced into this room and distributed through galvanized iron conduits in various parts of the room. The room where pig's feet, tripe, etc., are cleaned has about 4,000 cubic feet of air space per employee. These parts of the carcass are steamed (sterilized) preparatory to the cleaning process, which is done by women scrubbing and picking the parts. Water at about a temperature of 100° F. is used by the women in this process. The women stand on slats at the work benches so that they are not apt to get their feet wet when the floors are flushed with the hose. In the trimming and cleaning departments there are sanitary floors, which are frequently washed with a stream of water that drains off through gutters connected by traps with the sewer. The temperature of these rooms was comfortable, but considerable moisture is necessarily present. There were no particularly bad odors. In the room for labeling canned goods the employee has about 3,000 cubic feet of air space. The girls apply the lacquer to the packing cans with a brush. This is said to be an artificial lacquer which is made liquid with benzine, the odor of which is distinct, as the lacquer is kept in open pans. There would appear to be sufficient benzine in the air to affect the women workers. There is a provision for ventilation through the ceiling of this room, which is supposed to take away the vitiated atmosphere. It would seem practicable for this lacquering process to be done under an exhaust hood, so that the fumes of benzine would not be breathed by the workers. In the lithographing and large pail room there is ample air space per employee. Three girls are engaged in fastening bails to tin pails. The machinery used in this process is easily operated by a foot pedal, and is duly protected against accidents. In the can-soldering room the large soldering machine is placed beneath a ventilating hood. This machine was not in use, but it does not appear likely that all of the fumes would be removed from the rooms through this ventilating hood, which, like all other similar hoods, has a large inlet, but a comparatively small outlet. In the can-making room the soldering machines are kept near the windows, which permits some of the fumes to escape through the open window, while some of them escape into the room. In the canning room there are about 800 cubic feet of air space per employee. The steam washers for cans are placed beneath ventilated hoods, but much of the steam escapes into the room,

as the outlets of the hoods are too small. The soldering machines are placed beneath a roof monitor, but the fumes in part escape into the room. Girls who assist in the operation of the soldering machines have to manipulate a lever which holds the cans in place during the soldering. This requires but little effort, but as the lever is of iron, and but a short rod, it frequently causes soreness of the palms of the girls.

The cooking of potted meats is done by grills in an adjoining room, and considerable steam escapes into it. The exhaust fans and ceiling ventilators, however, are in operation. The policy is to permit steam and fumes to escape into the rooms and then to remove them therefrom by fans and ventilators instead of taking them up at their source.

Three girls work in the butterine department, wrapping the product. The sanitary conditions in this room are fairly good, except for a large open vat in which water is boiled for use in cleaning the floors. Electricity is used for lighting and driving the machinery throughout the plant. There are exterior fire escapes, which can be reached through windows, but necessitates stepping up about 16 or 18 inches. The company maintains a private fire department of five men. Fire hose are placed through the building, as are portable fire extinguishers and there is a good fire-sprinkler system installed. Iron lockers are provided for employees, but the rest rooms are small. Toilet and washing facilities are fair. The common drinking cup is used.

XVIII. *Cannery.*—This is located in a large, roomy brick building with excellent surroundings. The air space per employee is something more than 1,000 cubic feet. Good ventilation is provided by monitors and side windows. Bubbling cups are installed, and there are first-rate washing and toilet facilities and steel lockers for cloaks. This factory has its own laundry for washing employees' aprons. In the washroom towels are plentiful, and no employee needs to use a towel more than once. Liquid soap dispensers are also provided. Electricity is used for lighting and driving machinery, all of which is duly safeguarded, and none of which requires undue exertion of the operator. The plant is steam heated. The floors are of cement, and the drains are connected by traps to the sewer. This factory is roomy, well lighted, and clean, and the sanitary conditions are in all respects favorable. Sanitary cans are used in putting up the product, so that the process of soldering is done away with.

XIX. *Bag factory.*—Located in large, roomy, brick buildings, with good surroundings alongside the Belt Railroad tracks. The air space per employee varies from 1,500 to 2,000 cubic feet. There are numerous windows for ventilation and, in addition, air is forced into the rooms by large fans. The lunch and rest rooms are excellent. The drinking, washing, and toilet facilities are good. There are three exits in case of fire, but only one external fire escape.

The plant is heated by steam and by hot air, which is distributed through galvanized-iron conduits. Some of these conduits are used for distributing fresh air which is forced in by fans. The machinery, including the shafting beneath the sewing machines, is safeguarded, and no great exertion is used to operate any of them. A new machine for bag making is being tried out, which, if successful, will do away with the use of sewing machines. Some of the bag-cutting machines have galvanized-iron hoods attached which remove much of the dust and discharge it outside of the building away from the windows. In the burlap room this is especially arranged for, and it is planned to further extend the system by removing the dust at its source. In the printing department the dust from the printing press is removed in part by suction hoods placed over the press but not connected with it. One dust-producing machine was being operated while its suction hood was not being operated.

XX. *Garment factory.*—This is located in the Claypool Hotel Building. The general sanitary conditions in the sales department of this factory are good. The repair room is in the basement beneath the sidewalk. The air space per employee in the repair room is about 1,000 cubic feet. Ventilation is provided for by an exhaust fan, when its use is permitted, otherwise ventilation comes from an alleyway outside of this room in which old lumber is stored. This repair room is reached by a narrow stairway from the salesroom. In case of fire the employees might escape along this stairway or into the aforementioned lumber alley to other parts of the building. The toilet and washing facilities are fair, but separate towels are not provided for the workers. There is no lunch, rest, nor cloakroom. Four women work in this room, which is none too well lighted by electricity.

XXI. *Packing house.*—Located in a lage brick building in good surroundings, but alongside railroad tracks. The air space per employee is about 1,200 cubic feet. In the soup room the steam escapes from the vats, but is removed to a large extent by exhaust fans and ceiling ventilators. Similar provisions of ventilation are in the tomato-packing room. Numerous windows admit plenty of daylight. Electricity is used for lighting and driving machinery, which is duly safeguarded and easily operated. The plant is steam heated. Fire pails and water barrels are provided in the several rooms. There is no fire drill nor external fire escape, but there are stairways at both ends of the rooms. There are no lunch nor rest rooms. The washing and toilet rooms are fair, but a common drinking cup is used. A cake of soap is provided for common use. In the canning department the sanitary can and automatic machine is used which does away with the necessity of soldering. This is a progressive factory in which the use of modern machinery improves sanitation and promotes the efficiency of the employees.

XXII. *Cigar factory.*—Located in a brick building in good surroundings. On the third floor the air space per employee is about 225 cubic feet; on the second floor the air space per employee is about 2,000 cubic feet; and on the ground floor about 300 cubic feet per employee. Windows and the use in summer of desk electric fans provide the ventillation. The odor of tobacco is strong and irritating to the nostrils of those not accustomed to it. The toilet facilities consist of one seat on each floor. The washing facilities are but fair. There is a common drinking cup; no lunch nor rest rooms. There are no fire extinguishers nor fire drills, but there is one outside fire escape which extends from the third to the second floor. The manager stated that the drop extension to this escape would soon be provided. The plant is steam heated and electric lighted. There is no machinery, the product of the factory being cigars. This is an old building.

XXIII. *Laundry.*—Located in a nice, three-story brick building and has good surroundings. On the first floor the air space per employee is about 4,000 cubic feet, on the second 2,000, and on the third 1,800. The steam from the tumbling driers is conducted out of the building through galvanized-iron conduits, but much of the hot air from the drying room escapes into the workrooms. Each room has two exhaust fans and numerous windows, most of which are kept closed to keep out soot. The few that are open are covered with gauze to intercept the soot. All of the rooms are hot and humid. There are no lunch rooms. The rest, washing, and toilet rooms are but fair. The common drinking cup is used. The fire escapes consist of front and rear stairways. There is no fire drill, but fire extinguishers and wall hose are available. The machinery is motor driven and duly safeguarded, and its operation does not require much effort where trip pedals are used. All machinery is either steam or electric heated except the roller irons, which are heated by a gas flame. Galvanized-

iron heat deflectors are placed over these rollers for the protection of the operators. Soiled clothes are sorted without preliminary disinfection or moistening.

XXIV. *Laundry.*—Located in a two-story, reinforced concrete building, in good surroundings. The air space per employee in the working rooms is ample. These rooms are large, roomy, and high studded, and each has two large exhaust fans for ventilating purposes. The hot air from the tumbling driers is conducted out of the building through pipes, but the radiation from these pipes is sufficient to heat the room. The hot air escaping from the drying rooms is, for the most part, taken up by a large suction hood and discharged outside the building. There are no lunch rooms, fire drill, nor outside fire escape. There are stairways at either end of the room. The machinery is motor driven and adequately safeguarded and its operation does not require much muscular effort. All the machinery is either steam or electric heated except the gas-heated roller irons, which are supplied with galvanized-iron heat deflectors. Iron lockers are provided for cloaks, and there is a small rest room. The washing and toilet facilities are fair. Bubbling cups are used for drinking purposes. The influence of modern machinery on sanitation is shown in this factory, but, as in all laundries, there is necessarily high temperature and humidity. However, it appears practicable to bring this temperature and humidity within limits that are less injurious to the workers. Soiled clothes are sorted without preliminary disinfection or moistening.

XXV. *Laundry.*—Located in a good, brick building, in good surroundings. The air space per employee on both floors is adequate. Over the flat-work irons some of the steam is removed through an overhanging hood connected with an exhaust fan, and some of it escapes into the room, as does most of the hot air from the drying rooms. As these rooms are compartments they are not hooded. There are exhaust fans in the walls of the workroom for ventilating purposes. The windows are kept closed to keep out soot, and those that are partially open are covered by gauze. Electricity is used for lighting purposes, but the machinery is driven by steam, and there is considerable belting and shafting used. The common drinking cup is supplied. There is no lunch nor rest room, no outside fire escapes nor fire drill. The toilet facilities are fair. The cloakroom is in the basement and is poorly lighted. The machinery is either steam or electric heated except the gas-heated roller irons, and these have no heat deflectors for protecting the faces of the operators. Soiled clothes are sorted without preliminary disinfection or moistening.

XXVI. *Store.*—This is located in a large brick building, in good surroundings. The air space per employee in all the rooms is liberal and adequate. In the dressmaking department, where 75 girls are employed, solutions of dyes are heated in open basins on a gas plate, as are the flatirons. I could not learn the composition of these dyes, but the fumes of the heated flatirons were noticeable. The ventilation throughout the building is provided for by windows, except in the basement, where there are large galvanized conduits with exhaust fans. In this, as in other large department stores, there are pockets of close atmosphere, as the ventilating system is inadequate to provide sufficient dilution of air throughout the rooms. As is customary, most of the windows are kept closed, and the most serviceable ventilating apparatus consists in the elevator shafts and the stairways. The common drinking cup is in use. The washing, toilet, rest, and lunch rooms are fair. There is a fire stairway inclosed in a well at the rear of the building, and the approach to this is unobstructed. The store is steam heated and electric lighted. Some of the sewing machines in the repair rooms are power driven and some operated by foot pedals. Wherever flatirons are used for pressing, they are heated by gas

flame, and the fumes therefrom are allowed to escape in the room. Seats are provided for the employees' use when not actually engaged in work.

XXVII.—This department store is in a brick building, in good surroundings, which is steam heated and electric lighted. Ventilation by windows is provided for. Washing facilities consist of the use of cake of soap and roller towels for common use. The outside iron fire escape is blocked by the iron shutters of the windows. These shutters are held open by iron rods. The general sanitary conditions of this store are similar to those in other good department stores.

XXVIII. *Store.*—This is located in a brick building. The sales room is on the ground floor. The air space per employee is ample, but, as in other stores, is shared by numerous shoppers. Ventilation is provided for by windows only, which are usually kept closed, and in consequence the air becomes quite vitiated. The lunch and rest rooms are in the basement, and very poorly ventilated and lighted. The common drinking cup, cake of soap, and roller towels are in use.

XXIX. *Store.*—This is located in a brick building. Ventilation in the basement is provided for by exhaust fans and conduits, but is inadequate, there being several pockets of close atmosphere. The fumes from the kitchen range are conducted away by a large overhanging hood. The approach to the outside fire escape is blocked at several points by stationary tables placed in front of the windows. There is no fire drill, but fire extinguishers are kept in the rooms. On the main floor there are hot-air registers in the floor, which are used for heating purposes in the winter and which are said to be used in summer for forcing fresh air into the rooms. The repair rooms are partitioned off from the main rooms, and the flatirons used in pressing are heated on a gas plate or by electricity.

XXX. *Cloak house.*—This is located in a large brick building in good surroundings, and in the fur-repairing department the whipping machine is placed in front of a window, and the dust resulting therefrom is said to be forced out of the window by an electric fan. This was not in use at the time of my inspection. The common drinking cup is supplied. This store has a good fire stairway, inclosed in a brick well, and the approaches are unobstructed. There is no fire drill. All of these department stores partition off spaces for use as alteration, millinery, and repair departments, the partitions extending about 7 feet high and leaving from 5 to 8 feet between their tops and the ceiling. As a rule, only one door is provided in these partitions, and this construction is of importance in case of fire. The cloak lockers in the basement are in a small room, where ventilation is very poor.

XXXI. *Store.*—This is located in a large modern fireproof building. The general sanitary conditions are good, but the practice of partitioning off spaces for repair and millinery work is followed. The basement is ventilated by force and exhaust fans and galvanized-iron conduits and is fairly good. The fire escape consists of a stairway in a brick well. On the third floor the approach to this escape was temporarily blocked by packing boxes. The baking ovens are provided with hoods and exhaust fans for removing fumes. The crockery packing room is in a poorly lighted and ventilated corner. Seats are provided for clerks when not at work. There is a small rest room for employees, which is also used for an instruction room. There is a single-bed sick bay adjoining.

XXXII. *Dry goods store.*—Located in a brick building in good surroundings. The office where girls work is situated on a balcony where constant use of artificial light is necessary, and the atmosphere is close. This Chinese system of utilizing space is not uncommon in department and other stores. Spaces

are partitioned off in the main work room for use as repair departments. The common drinking cup, cake of coap, and roller towels are provided for common use. The toilet rooms are poorly ventilated. There is a lunch room, but no rest room. There are no outside fire escapes. Fire extinguishers are kept in the building. There is a narrow, dark stairway leading from the second floor to the lunch room. Pressing irons are heated on gas stoves. The store was overheated and poorly ventilated.

XXXIII. *Store.*—Located in a brick building in good surroundings. The ventilation on the main floor is poor, the atmosphere being close, the only provision for ventilation being by closed windows. There is a small lunch and rest room, no fire drill, but there are fire exits and extinguishers. Common drinking cup, bar soap, and towel are used. The sanitary conditions of the toilets are fair.

XXXIV. *Dry goods store.*—Located in a brick building. The common drinking cup, bar soap, and roller towel are used. The lunch room is small and stuffy. There is no rest room nor outside fire escapes, but fire extinguishers are kept in the building. The manager stated that he had a monthly fire drill, but when I asked him to show me the fire escapes he said he really didn't know where they were located. There are seats behind the counters for the use of clerks when not working.

XXXV. *Store.*—Located in a brick building. The common drinking cup, bar soap, roller towel, and hair brush are used. The rest and lunch rooms and sick bay in the basement are dark. The ventilation is poor. The fire escape from the basement consists of wooden steps placed in the window pits, which are about 4 feet above the floor. These window pits are covered over by iron grating. The elevator shafts, a few electric desk fans, and windows provide for ventilation. There are no exhaust fans.

XXXVI. *Store.*—This is located in a large brick building. The basement is ventilated by elevator shafts. There are no exhaust fans or conduits, and in the basement there are several pockets of close, stuffy atmosphere. Sanitary drinking fountains are provided in this store. The wash rooms are provided with liquid soap and roller towels. There is a rest room, but nó lunch room. There is no fire drill, but fire extinguishers are provided, and the approach to the fire stairway is easy. The general sanitary conditions of this store are good except as to ventilation in the basement.

XXXVII. *Cracker factory.*—This is located in a four-story brick building, in good surroundings. Electricity is used for lighting and machinery power throughout this steam-heated building. The air space per employee on the third-floor icing room, where women are employed, is ample. The room is high studded and well lighted. The walls and ceilings are clean and the condition of the wooden floor is good. Girls engaged in applying the icing to cakes stand at their work, which consists of immersing the cakes in a pan of icing with their naked hands and then sticking them on sharp wire prongs attached to the bars held by the traveling belt or icing trolley. It is said that occasionally a girl receives slight puncture wounds on her fingers from these wire prongs, but that no serious trouble has ever resulted. Gelatin is a constituent of this icing, and the icing is only brought to a temperature of about 210° F. The gelatin used is the ordinary commercial gelatin. The icing does not appear to irritate the hands of the girls. At other icing pans girls remove the bars from the icing trolley and dip one side of the cakes, and similarly apply the finishing coat of sugar and water. They stand at this work. Girls are also engaged in placing cakes on wooden trays, which they stack up when full. In applying marshmallow to cakes the girls hold the marshmallow bags in the left hand and with the right hand squeeze out the required amount on each cake. Girls are said not to push the heavy trucks used in conveying trays of

cakes, etc., from one part of the room to another. About 20 girls are engaged in "picking off" cakes and crackers from chain-belt conveyors and placing them in tin packing boxes. They do not lift the iron trays from this belt conveyor. The work requires standing. The condition of the atmosphere in this room is good except for the confectionery odor. The sanitary conditions of the dressing rooms, toilet and wash rooms, and drinking facilities are fair, and the machinery to which the girls are exposed is adequately safeguarded. On the second floor, where girls are employed in the can and buffing room in work similar to that performed on the third floor, several soldering irons are heated over an open gas flame. The soldering is done by men and is required in repairing tin packing boxes. The amount of fumes escaping into the atmosphere of the room is not noticeable, as the amount of work required is said to be but little. In this same room men are engaged in polishing tin packing boxes by means of a brick-dust polish and rapidly revolving polishing wheels. These wheels are hooded and connected with suction conduits, so that but little, if any, of the dust escapes into the room. In the bread-making department, which is in a separate building, girls are engaged in wrapping loaves of bread and in icing layer cakes. All machinery in this department is operated by men. Girls are also engaged in this room in placing crackers in tin packing boxes. It is well lighted and ventilated, and heated by steam pipes hung from the ceiling. In an adjoining room men are engaged in mixing dough for making crackers, and some of the flour dust from this process escapes into the air, but it is not very noticeable in the room where the girls work. In this factory the roller towel and bar of soap are supplied for common use, as is the common drinking cup. The general sanitary conditions, however, are good.

XXXVIII. *Underwear factory.*—This is located in a large, three-story brick building, which is of modern construction. The workrooms are large, high studded, and have good floors. Numerous windows provide for ventilation and admit much daylight. The machinery is driven by electric motors and has sufficient safeguards. The workrooms are comfortable, there being no excessive temperature nor humidity. The shrinking machines are placed near the windows and are hooded to catch the escaping steam. In the cutting department the sewing machines are motor driven, but hand shears are used by the girls in trimming the goods. The lunch room is neat and well appointed. There are some sanitary drinking cups and some cups for common use. The washing facilities are good. The cake of soap for common use is supplied. Cloaks are hung on racks in the workroom. There is a stairway tower at each end of the room and the approaches to them are unobstructed. A good sprinkler system is installed. The sewing machines in the finishing department are motor driven and a good guardrail protects the shafting. The lighting and ventilation are good. Some lint necessarily arises from the knitting machines, but this is not excessive. The plant is steam heated and electric lighted, and is said to be opened up and thoroughly aired out every morning a half hour before the employees go to work. In the workrooms there are swinging boxes in which are kept green plants. The sanitary condition of the toilets is good.

XXXIX. *Glass factory.*—The hygienic conditions under which women work in this plant are fair, and where they operate machinery but little effort is required by the work, and the machinery is adequately safeguarded against accidents. The noise and jarring from the machinery, however, is considerable. The workrooms are dark and electric drop-lights overhang the places at which they work. Girls engaged in sorting bottles and tin cups wear gloves. The washing facilities supply roller towels and common cake soap and washbasins in the working rooms, and in some places a tin dipper

is used for drinking purposes. The sanitary condition of the lunch and rest rooms are fair, and the rooms where the women work are not pervaded by fumes from the rooms where men work. The most unfavorable hygienic condition affecting women in this plant is the continuous noise and jarring of the machinery. Those girls who are seated at their work feeding the machines appeared to be more fatigued than those who had to move about. This rather indicates that monotony and muscular inactivity is less beneficial than active muscular exercise with a variety of conditions to attract the attention of the operator.

XL. *Metal factory.*—This is located in a modern brick building, with good surroundings, outside of the city. In the packing room girls lift trays containing spoons, knives, and forks, etc., from the floor, or from a low table, to their work benches. These trays weigh, perhaps 25 or 30 pounds. They do not have to carry them, but merely lift them on to their work table. In the polishing room rapidly revolving polishing brushes are placed under shields and wet pumice stone and chalk are used in polishing the ware. In this work the girls use their bare hands, but none of them showed any evidence of irritation of the skin of the hands. There is no dust from this process. In the pressing room some of the presser machines have guards, but the girls are said not to use them, because they are in the way. Operation of this machinery requires but little muscular effort. In the etching room the windows are closed and the fumes of soda and acid are noticeable. No artificial ventilating system is provided. In the plating room considerable steam escapes into the room, although there are exhaust hoods and fans installed for preventing this; but, as is customary with such exhaust hoods, the outlets are entirely too small, even though the exhaust fans are run at full speed. In the washing room for the plated silverware, considerable steam escapes into the room, and some of it passes through a door into the adjoining inspection room where women work. The sanitary conditions of the toilet and washing rooms are fair.

XLI. *Steel and wire factory.*—This is located in a good brick building, with good surroundings. Most of the girls employed here are engaged in office work. Some of the office rooms are commodious and well appointed, while others are less so. In printing room girls fold paper for making catalogues, and while the stripping machines and folders are easy to operate, there seems to be need for more adequate safeguards. However, it would appear that the operation of these machines as they are would be perfectly safe, if the girls were careful in using them. There are sanitary bubbling cups for drinking purposes. The roller towel and bar soap are used in the wash room. There is no rest room, but there is a cloak room. The general sanitary conditions under which women work here are good.

XLII. *Sheet and tin plate factory.*—This is located in a brick building, in good surroundings. The women work in a large, high-studded, well-lighted room, and are engaged in inspecting tin plate. Light is supplied by the Cooper-Hewitt lamps. The girls wear gloves in handling the tin plate. Ventilation is provided by doors and windows, and the room is heated by forcing in steam-heated air and distributing it through conduits. In summer this heating system is used for forcing in outside air. The girls stand on a brick floor by large tables on which the tin plate is piled. Each plate or sheet of tin is turned over for the purpose of inspecting both sides. This requires continuous muscular exercise, and among those girls who have been working at it for some time a very erect position of the body has been developed. This was so noticeable that I was able to pick out the girls who had been in this work for some time and those who had been in it but a short time. It appears to be a good physical exercise. The brick floor upon which they stand seems to be the only bad fea-

ture of this work. A good feature of this work is the provision against overfatigue. This is piecework; but when the girls get tired they are at liberty to go in the adjoining rest room, where there are rocking chairs, and rest. There are no lounges upon which they may lie, and one girl was lying on the lunch table. This shows a desirability of all rest rooms having lounges upon which girls may rest. Bubbling drinking cups are supplied, and electric desk fans are provided for use in summer in the workrooms. The common bar soap is used in the wash room, but individual towels are supplied and are hung on the rack along with the girls' cloaks. The general sanitary conditions under which the women work are good. It is probable that the places where women stand should be supplied with rubber mats and rugs so that they will not have to stand on the hard brick floor.

XLIII. *Glass factory.*—This is located in a brick building, with good surroundings. Girls are engaged in the manufacture of lamp chimneys, globes, tumblers, and reflectors. In the cutting department girls stand at their work on wooden floors alongside of the machines, which are equipped with small gasoline heaters, used in making the hot line preparatory to cutting. The odor from these heaters is noticeable and escapes into the room. In the glazing department crude oil blow torches are used to smooth the ends of the chimneys, and these torches give off noticeable fumes and much heat. The lamp chimneys are placed on a traveling belt, which conveys them beneath these blow torches, and when they emerge girls, who sit alongside the belt, rapidly invert the chimneys and replace them on the belt, which passes under another blow torch, which smooths the other end of the chimney. These turner girls wear gloves and have an electric fan blowing on them continuously, as their position is very hot. These crude oil blow torches are not placed under hoods, but there is a large monitor in the roof above them. The side windows and the windows of the monitor are kept open, and much of the heat and fumes are able to escape. It would seem practicable to install more effectual heat deflectors. In the grinding department girls stand at their machines, which are easily operated by foot treadles. As water is used in the grinding process, there is no dust arising from the grinding machine, but after the lamp chimneys become dry there is dust on them, and this is removed by two young girls, who place the chimneys on revolving polishing brushes. There are no exhaust fans or hoods for removing this dust. In the washing department women stand on racks alongside large tanks of warm water and wash the oil from the lamp chimneys, using a soap paste. These women are provided with rubber aprons to protect their clothing. This place is dark, and only one electric light is supplied. These workers appeared to be tired. For drinking purposes condemned tumblers are used, and the supply is adequate. In the tumbler-grinding department girls easily operate the machines by foot pedals, and they stand on racks to protect their feet from the water that escapes from the grinding machines. These girls feed the machines with glasses that are placed on racks easily reached and brought to them by men. Several of these girls had handkerchiefs tied around their foreheads and appeared to have headaches. One young girl in this department, who seemed particularly fatigued, had stopped work and was seated on a wooden bench near by. In the tumbler-glazing department a girl feeds the machine, but a man removes the hot glasses from the traveling belt. An asbestos shield protects the girl from the heat of this coal-oil blow torch and to a much less extent protects the man who removes the hot tumblers. There is no ventilating hood over this blow torch. The noise created by these blow torches is considerable. In the stamping department, where chimneys are marked with hydrofluoric acid, girls sit at tables and apply the acid, which

is kept on stamp pads. In this factory young girls are employed, some of whom appear to be rather fully developed for their apparent age.

The general conditions in this factory in several respects tend to produce overfatigue of the women employees as well as the girls. The sanitary conditions of the toilets are not very good and the washing facilities are but fair. There are no rest rooms. Cloaks are hung on pegs in the workroom.

XLIV. *Rubber and insulated-wire factory.*—This is located in a brick building at the outskirts of the town and has good surroundings. The air space per employee in all of the workrooms is ample, but the general system of ventilation is through windows. The odor of rubber is noticeable in the workrooms. As the day was cloudy, electric lights were in use. The machinery was duly safeguarded and easily operated, much of it being automatic. The braiding machines make considerable noise, but new so-called noiseless braiding machines are being installed. These require less time and attention on the part of the operator and allow the workers to sit. In the general workroom, where men attend to the machinery, a few girls were cutting washers for hose joints. This is done by the use of a lathe and sharp knife held by the girl, who is standing at work. Two girls work in the varnish room trimming loose ends on braids of wire. They sit under an electric light. The varnish driers tend to overheat this room, and the odor of varnish is quite noticeable. In an adjoining room one woman, standing, winds wire on a coil. Two girls make gas bags for automobiles by cutting the rubber with scissors and gasolining it. The gasoline is kept in open cans and is applied with a brush to the rubber. The fumes of the gasoline escape into the room and are quite distinct. These girls also blow soapstone into the gas bags. While girls tend the automatic braiding machines, the heavy reels on which the braided wire is rolled are handled by men. Drinking water is supplied from buckets carried around the factory by water boys. Forty girls work in the braiding room, where the odor of rubber is distinct. The sanitary conditions of the water-closets is poor. Some of the female employees eat the midday meal at home, while others bring their lunch and eat in the workrooms. There are no washing facilities, lunch nor rest rooms. There are no outside fire escapes. As this is an old building, the wooden floors are in a rather poor condition and the facilities for admitting daylight are but fair. The stairways are narrow and of wood and constitute the only means of escape in case of fire. I understood that the building of a new factory is under consideration.

XLV. This department store is located in a brick building with good surroundings. The salesrooms are large and ventilated by windows and elevator shafts, also stairway. Some of the dressmaking, millinery, and repair departments are partitioned off from the main salesroom by 8-foot partitions, but most of them extend to the ceiling. In the fitting room the air space per employee is about 250 cubic feet. In the other workrooms the air space per employee varies from 500 to 1,000 cubic feet. In the ladies' dressmaking workroom the approach to the outside fire escapes is through a window and is blocked by a worktable. The cloaks of these workers are hung on pegs in their respective workrooms. The roller towel and bar soap for common use are supplied, as are sanitary drinking cups. The sanitary condition of the toilets is fair. Electirc lights are used during the day in the workrooms. Ventilation and heating are not very good.

XLVI. *Dry goods store.*—This is located in a brick building, which is heated by stoves. The windows were closed and the room hot. In the repair room, where 11 women work, the air space per employee is about 360 cubic feet. There is no outside fire escape. The toilet and washing facilities are but fair. There is no rest nor cloak room.

XLVII. *Dry goods store.*—This is located in a large brick building, and the general sanitary conditions are fairly good. The repair rooms were being removed from the fourth to the third floor, where good light through large windows will be available. Ventilation is provided for by windows and the heat registers are placed in the floor. Seats are provided behind the counters for clerks when not working. The toilet, washing, and cloakroom facilities are fair. The approaches to the external fire escapes are not blocked. In this, as in other department stores where there are no adequate artificial methods of ventilation, there are, in certain parts of the rooms, pockets of stuffy atmosphere.

XLVIII. *Store.*—This occupies but one floor in a brick building. Hot-air registers are placed in the floor and not protected from floor sweepings. The ventilation is inadequate, as the windows are kept closed for the most part. There is no lunch room. The toilet and washing facilities are poor.

XLIX. *Store.*—This is located in a brick building. The millinery repair room on the second floor is formed by a 7-foot partition, and the women working in it complain that it is insufficiently heated. The roller towel and liquid soap are provided in the wash room. The place is lighted by electricity and steam heated. Ventilation in the basement is poor, as there are only small windows that open near the sidewalk, and these are not kept open. There is no artificial system of ventilation. Fire escape from this basement is by a wooden stairway and elevator. Electric lights are used during the day. The sanitary condition of the closets is good. There are no lunch nor rest rooms.

L. *Electric-lamp manufacturers.*—This is located in a modern reinforced-concrete building. The workrooms are large, and there are a number of large exhaust fans placed in each. The work requires the use of a great many gas blow torches, none of which is hooded for the purpose of carrying off the heat and fumes, the policy being to allow these to escape into the room and relieve the condition by the continued running of the exhaust fans. It is said that girls do not remain long at this work, the reason very likely being the condition of the atmosphere in which they have to work. Girls who do not go out for lunch eat in the workrooms. Sanitary bubbling cups are provided for drinking purposes, and roller towels and common bar soap for washing purposes. The sanitary conditions of the water-closets are good. The rest room is small but neat and well appointed. There is a good restaurant in the building, which is patronized by some of the workers. There is a dispensary with a nurse on duty. There are outside fire escapes and city hose in several parts of the building. Lamps are washed under ventilation hoods. The grinding on carborundum wheels does not appear to give off much dust, but these wheels have no exhaust hoods. On the second floor cold air is forced into the room and distributed through galvanized-iron conduits. This facility seems ample. The rooms are steam heated by pipes suspended from the ceiling. There is considerable glare resulting from the testing of the incandescent lamps. The air space per employee is quite ample, and this is an example where ample air space does not necessarily mean good air. The character of this work, requiring as it does the use of so many gas blow flames and gas heaters for the exhaust machines, is such that it is really difficult to see how the hygienic conditions under which women have to work can be improved. This is a progressive factory, and the disposition of the management seems to be to provide all practical hygienic betterment. Certain unfavorable hygienic conditions are perhaps unavoidable. One stage of the process of lamp making is where the lamps are put on small iron trays or racks which girls lift, but they are not heavy and require but little exertion.

LI. *Glove factory.*—This is in a two-story frame building in fairly good surroundings. There is an outside wooden fire escape, which is blocked at the bottom by large packing boxes. The sewing machines on the second floor are motor driven and each has a drop-light over it. The line of shafting has a guardrail. There is considerable dust from the sewing on canton flannel which is allowed to escape into the room. The wooden floors are old and dirty. Windows alone provide for ventilation. The workroom is heated by coal stoves. The water-closet is dark and poor. There is a sink in which workers may wash their hands. A cake of soap and commonly used towel are provided. There are no rest nor cloak rooms. The air space per employee is ample, as are the provisions for admitting daylight.

LII. *Shirt-waist factory.*—Located in a brick building; manufacturer of shirt waists. The room in which 125 girls work is 135 by 90 by 12 feet. Ventilation is provided by windows and ceiling registers opening into the attic. The irons are electric heated. The shafting beneath the sewing machines has a protecting guardrail. There are four desk fans on each line of sewing machines. The roller of the pleating machine is heated by gas. The temperature in this room was comfortable. The laundry in the adjoining building supplies the heat for this shirt-waist factory. Bar soap and roller towels are provided for common use, and the toilet facilities are fair. There is a small gas stove in the attic where girls make tea or coffee for lunch. Cloaks are hung in the workroom.

LIII. *Glove factory.*—This is located in a brick building in good surroundings. The workroom is on the second floor, is large and well lighted and provides ample air space per employee. Cloak racks are in this room. The glove-turning machines are operated by a foot treadle, but the operators seem to take their time at it. The steam-heated conformers, as is usual in glove factories, allow the escape of a small amount of steam at the wrist joints. An automatic mangle is used for ironing the gloves, and its operation does not require much exertion. It is adequately safeguarded. Ventilation is provided for by windows, and in summer there are ceiling electric fans in use. There is a large cutting room in the basement where one woman works at placing cut parts in boxes. The basement floor is of cement. The general sanitary conditions are fair. In the sewing room the air space per employee varies from 350 to 500 cubic feet, depending on the number that may be working. There is not so much lint in the atmosphere in this room, as canton flannel is not used in making this class of gloves. The shafting beneath the sewing machines has a guardrail. The plant is steam heated and electric lighted, and electric fans are provided for use in summer. The common drinking cup is used, as is the roller towel. There is no rest room. The sanitary condition of the toilet is fair.

LIV. *Knitting mills.*—This is in a large, well-constructed brick building with commodious, well-lighted workrooms, some of which are heated by steam and others by hot air, but none of which appears to be overheated. Ventilation is provided by windows, and in the sewing and looping room the machines are being rearranged so as to have the north light from the windows fall over the shoulders of the workers, it having been noticed in this room that where the north light struck directly in the face of the workers they became tired and indisposed as the day passed. The manager realizes that efficiency of employees can be promoted by providing good, hygienic conditions under which they work. All machinery is cleaned by men with compressed air. The washing and toilet facilities are good and the air space per employee in all the rooms is liberal. The threads used in knitting are kept moist so that the amount of lint that escapes into the room is reduced to a minimum. The belts

used on some of the machinery makes some dust and the machinery produces noise but not much jarring. All of the workrooms were comfortable. The toilet and wash room facilities are good and the manager employs a matron to look after them. The general hygienic conditions of this factory are commendable.

LV. *Knitting mills.*—This is located in a brick building across the street from the mills above referred to and under the same management. The same general sanitary conditions of this factory exist as are found in the other mills. There is a dormitory club building, with lunch, toilet rooms, and rest rooms, all of which are excellent.

LVI. *Knitting mills.*—This is located in a brick building in the vicinity of a soap factory, the disagreeable odors of which frequently invade the knitting mills. The plant is steam heated and electric lighted. Each machine has its own motor. The shafting under some of the machines is only protected by a horizontally placed wire, but wooden guard boards are being installed. There is no lunch room. The girls who do not go home to lunch eat in the workrooms. The sanitary conditions of the inadequate toilets are fair. There are no washing facilities; that is, soap and towels are not supplied. There is not much lint in the room, as the threads used in the machines are kept moist by revolving cylinders or by passing them over oiled pads. The temperature in the workrooms is kept at about 72° F. and windows alone provide for ventilation.

LVII. *Soap factory.*—This is in a brick building with good surroundings. The odor of soap making throughout the building is quite noticeable. Ventilation is provided for by windows and the rooms are steam heated. Bars of soap said to contain naphtha and carbolic acid are removed from traveling belts by girls and wrapped in paper. This is not hard work, but the girls stand at it. They do not use gloves while handling this bar soap. The room where girls work is closed off from the soap-making department. In the room where pasteboard boxes are filled with soap powder girls are engaged in placing empty boxes on traveling belts, which feeds the automatic filling machine. This machine has a small suction hood which was put on for the purpose of taking up soap-powder dust to prevent its dissemination in the atmospbere of the room. I found this suction apparatus blocked by lumps of soap powder and the escape of the soap-powder dust into the room was considerable. Upon removing this obstruction, however, most of the dust was sucked up and taken away. This obstruction could readily have been removed by the girl operators. This room was well lighted and heated, but the floor was covered with soap dust, as was the machinery.

LVIII. *Glove factory.*—This is located in a one-story brick building alongside the railroad track. The floor is of cement. Fire extinguishers are kept in the rooms. Ventilation is provided for by windows only. The plant is steam heated and electric lighted, and electric fans are placed on each worktable for use in summer. The glove-turning machines, which are of the usual type previously described, are operated by little girls. Women and girls operate the sewing machines and the dust created by the sewing escapes into the room. The shafting beneath the sewing machines is protected by a guard board in places and in others by a galvanized iron cuff which is suspended from the under surface of the sewing-machine stands. The steam "hands" or conformers leak steam about the wrist joints. There are two sinks for washing facilities. Liquid soap and roller towels for common use are supplied. The water-closets for men and women are partitioned off from the main workroom and adjoin. The sanitary condition of them is fair. Cloaks are hung on pegs in the workroom. The machinery is driven by electricity, which is controlled by a switch at the end of the workroom. The air space per employee is ample, but there is no artificial method of ventilation nor for removing the lint produced by the machines.

LIX. *Store.*—Girls only work on the main floor of this brick building. The rest and lunch room is in the basement and has one electric light and a gas stove for warming purposes. It is only a partitioned-off space from the main store and is unfit. The water-closet is in the basement and the sanitary conditions are poor. The water was dripping into it from the sidewalk. The washing facilities consist of a bar of soap, roller towel, and a dirty washbasin. The ventilation of the main salesroom is provided for by windows only and these, as usual, were kept closed. The room is steam heated and overheated.

LX. This department store is in a three-story brick building, which is steam heated and electric lighted and receives its ventilation through windows. The approach to the outside fire escape on the third floor is through a window, which is blocked by a table holding crockery. A similar approach from the second floor is blocked by cloak racks. There is a small rest room on the third floor. The roller towel and bar soap are supplied for common use. The toilet facilities are fair. In the repair rooms electric irons are used and the sewing machines are driven by foot. A pitcher of water and a common drinking cup are used in this repair room. The millinery workroom at the rear of the second floor is partitioned off from the salesroom by a 6-foot partition and here gaslight is used, as are gas heaters for pressing irons, the fumes of which escape into the room. The four windows are all closed. The air space per employee in this store is adequate and the store did not appear to be overheated.

LXI. *Store.*—This is located in a stone-front brick building with good surroundings, is steam heated and electric lighted and window ventilated. Liquid soap and bar soap and roller towels are provided for washing purposes. The sanitary condition of the water-closets is fair. In the alteration room electric irons and foot-driven sewing machines are used. In addition to the steam heat for the basement a small gas stove is used. The ventilation of the basement is along a narrow stairway leading from the first floor. There is no mechanical ventilating system, and no way of escaping in case of fire, excepting along the narrow stairway. The place is lighted by electricity during the day, as there are no windows. The air space per employee is ample and shared by the shoppers.

LXII. *Plow works.*—The offices in which girls work are commodious and well appointed. The building is of brick construction, steam heated, and electric lighted and has ample daylight. The offices are ventilated by windows. About 80 girls work at core making in a large room, which has a cement floor upon which they stand. This room is above the core-baking room and has openings through the floor for the moving lift upon which trays of cores are lowered into the bake room and empty trays are returned to the core-making room. These openings permit smoke and fumes from the baking ovens to enter the core room where the women work. In the process of core making girls hammer the steel molds, which causes considerable noise. In removing the hot trays that are returned from the bake room the girls use cloths. The room is steam heated and a cloak and rest room adjoins it, but there are no chairs in the rest room and there is no soap nor towel supply for washing purposes. In the bake room below there are 10 girls employed in removing the baked cores from pans. This factory maintains an emergency hospital with a trained nurse always on duty during working hours. The air space allowed the core makers is ample, but the atmosphere is vitiated by the odors of burnt oil that arise in connection with the baking of the cores.

LXIII. *Shirt factory.*—This is located in large, well-constructed brick buildings, all of which are steam heated and electric lighted. The irons used in this work

are gas heated and easy to use. The floors are of wood. The laundry washers are in this same large room, but do not give off much steam. In the ironing room the drawbar driers, when the bars are fully pulled out, prevent the escape of heat from the driers, but as they are not fully pulled out, as a rule, considerable heat escapes, as it does from the conveyor drying room, which has no overhanging hood. The general conditions here are similar to those in other laundries. The gas-heated sleeve-roller irons are not provided with heat deflectors. The gas-heated body irons have asbestos deflectors. The bosom pressers are steam heated. The sleeve sticker is operated by a double pedal, one throwing in the pneumatic pressure and the other releasing it. None of this laundry machinery requires any particular effort to operate it. In the finishing department the center-pleat iron is steam heated and easily operated. Electric power is used for the machinery. The sewing department on the second floor of building No. 1 has a long line of sewing machines, the shafting of which has a 1-inch guard board. This room is provided with exhaust fans and the general conditions are good, except for the noise created by the machines. Cloaks are hung on racks in this room. On the second floor of building No. 3, I noticed a girl pushing a fairly heavy truck, but this was said not to be her business, as boys were provided for this. Roller towels are provided for hand use only, but individual towels are supplied for use on the face. Provisions against fire in this plant are fairly good. The air space per employee in the several rooms where women work is ample and none of them appear to be overheated or unduly humid, except in the laundry, and this heat and humidity was not excessive. The women using the gas-heated iron appeared to be fatigued, while those operating automatic steam-heated irons did not appear to be fatigued.

LXIV. *Box factory.*—On the third floor one woman stands while she feeds cylinder printing press, and three women, who also stand at their work, "break out" strips from the machine-cut pasteboard used in making the boxes. In this work they use hammers. A fourth woman doing this work was seated. In this same room three girls feed the box-gluing machine. This is easy work and the machinery is safeguarded. There are two outside iron fire escapes, the approaches to which are through windows that are about 2 feet above the floor and are partially obstructed by the machinery in the rooms. The toilet and washing facilities are fair, but the roller towel and cake of soap for common use are supplied, as are sanitary drinking fountains. Several girls on the second floor of this rather old brick building run short tapes through holes punched in the pasteboard boxes, using for this purpose hairpins. Some of the boxes are glued together by strips of paper, which are applied by the girls. The box is placed on a revolving holder and requires the girl to stoop some while guiding the strips of paper on which the glue is placed. There are no lunch, rest, nor cloak rooms. The Sturtevant blower system of heating and ventilating is used, and seems to be efficient. In the basement near the elevator shaft one girl is engaged in feeding the lining machine. She sits while doing this work, for which there is fairly good light.

LXV. *Watch factory.*—This is located in a large brick building with good surroundings. There is a good lunch and cloak room and the sanitary conditions of the toilets are good. There are places for washing, but the employees are required to supply their own towels and soap. It is necessary in this industry to keep the workrooms especially dry, in order to prevent microscopic rust of the watch machinery. For this purpose the Sturtevant blower heating system is used, but the atmosphere is drawn from the several rooms continuously and reheated by passing through the steam coils, whence it is returned again to the workroom. The only fresh-air dilution of this reheated air gets in by accident through cracks in the windows. A record is kept of the humidity in

these rooms, and in the report shown me it varied from 30 to 67. The dry condition of the atmosphere did not seem to annoy the workers. In this plant fresh air should be supplied instead of using over and over again practically the same air, which is continuously reheated and kept at a temperature of about 70°. It would be practicable to provide such fresh air, and at the same time obtain the desired relative humidity, by the process of refrigeration. In one part of the factory a girl solders dial parts, but there are not many fumes escaping from this but those that do pervade the room. The air space per employee throughout the factory is ample and the daylight is good.

LXVI. *Department store.*—This is located in a large brick building, which is lighted by electricity and steam heated and ventilated by windows. The general sanitary conditions in the salesrooms are fair. The common drinking cup is supplied. In the repair rooms some of the sewing machines are motor driven and some are driven by foot. Electric irons are used. The millinery repair department is located on a balcony where ventilation is not good, as the windows are kept down. There are no external fire escapes on this three-story brick building. The air space per employee is ample in the salesrooms, offices, and workroom.

LXVII. This drug-preparing firm is located in a large brick building, which is electric lighted and steam heated and window ventilated. Ample air space is provided for each employee. One girl was assisting a man in making an ointment, the fumes of which were noticeable, as the ointment had been melted by heat. These fumes escape into the room. In what is called the tonic-mixing room the leaves of several drugs are placed into a barrel, which is rapidly revolved by a man turning a crank. The dust from this is considerable. When the tonic has been mixed, girls fill cartons with it. In this work they are exposed to the dust. It was not practicable to determine what drugs were used in making this tonic. The dust might, however, exert a physiological as well as a mechanical bad influence on the health of the girls. However, none of them seemed to be affected by it. There were no exhaust fans nor conduits to care for this dust. The roller towels and bar soap for common use are supplied and the sinks are good, as are the toilets. There are no rest nor lunch rooms. The general sanitary condition of the place is good.

LXVIII. *Cigar-box factory.*—This is in a large brick building, where five girls work at pasting papers on cigar boxes. The air space per employee is ample. There are no rest rooms nor cloakrooms. The washing facilities are but fair, as are the toilets. The girls did not appear to be exposed to any injurious conditions. The workroom, however, was not particularly well lighted by daylight.

LXIX. *Department store.*—This is in a large brick building, with electric lights, steam heat, and window ventilation. The general sanitary condition of the salesroom is good. The air space per employee in the "dress-alteration" room, on the second floor, where three women are employed, is about 320 cubic feet. In the suit-alteration room, where 11 women and 1 man work, the air space per employee is barely 250 cubic feet. The temperature of this room was hot and the atmosphere was noticeably vitiated by expired air. There were eight windows in this room, none of which were even open. The partition making this room extended to the ceiling. The washing and toilet facilities are fair, as are the cloakroom facilities.

LXX. This is located in a brick building in the country, in good surroundings. This company until recently manufactured asbestos goods. It is now engaged in the manufacture of asphalt roofing material. The air space per employee is ample. The odor of asphalt is distinct, and where the strips of asphalt are drawn through the powdered mica considerable mica dust arises, which pervades the entire workroom. There is an exhaust fan and wooden con-

duit designed to remove this dust, but it is ineffectual, and the outlet of the conduit is on the side of the building and does not extend above the roof. Girls are engaged in tying up nails in paper sacks and labeling rolls of roofing. The water-closet is in a separate building and is dirty. There are no cloak nor lunch rooms. The principal sanitary need in this place is the proper handling of the mica dust.

LXXI. *Mica factory.*—Seventy-five girls are engaged in work here in a large room on the second story of this brick building, which is located in good surroundings. Wide strips of paper are laid on long tables, and on this the girls paste small sheets of mica, using for this purpose a shellac made up of denatured alcohol, which they apply with a brush. This shellac is kept in open bowls and the fumes escape into the room. The ventilation, however, was good at the time of my visit, as a sufficient number of windows were up. At this work the girls stand. The girls who do not go home for lunch eat their lunch in the workroom. At one end of the room there is a line of washbasins. Cake of soap and roller towels are used. The water-closets are partitioned off from this room and their sanitary condition is good. The room is steam heated. The building being only two stories high, there is no outside fire escape. There is no rest room, but there is ample space in this workroom for such.

LXXII. *Drug factory.*—This is located in a large brick building of modern construction. In one corner of a large room 20 girls work at motor sewing machines making surgical garments. The pulleys on the shafting are guarded by galvanized-iron hoods, but the shafting proper is not guarded. Ventilation is provided by windows. Heating is by warm air distributed through the room by conduits. There is ample daylight. In the office from 60 to 70 girls do clerical work under good hygienic conditions. On account of a recent fire the drug-preparation department is carried on under temporary conditions. Bichloride of mercury tablets are prepared in the usual manner by girls who are said to work only one-half day every two weeks at this particular job. This is to prevent cumulative effects of the mercury. While making the tablets the girls use cold cream on their faces and wear rubber gloves and they are required to wash their hands immediately after they stop work. The mass from which the tablets are molded is kept moist all the time by a mixture of alcohol and water for the purpose of preventing dust. This is the method of preventing dust in the preparation of all other tablets, including cocaine. The practice of applying dry powder to the outside of these moist tablets is not followed in this factory, so that the process at no stage produces dust. It is a very good system. An antiseptic powder containing, among other things, carbolic acid and thymol, is rubbed through a very fine sieve by the hands of a girl. This powder is kept moist and this process does not produce dust. Cloaks are hung on pegs in the main workroom. The sanitary condition of the water-closet is good, but it is placed near the men's closet. Cake of soap and liquid soap are supplied for washing facilities, as are group towels, so that girls doing different kinds of work use their own group towels. There are three girl typesetters working in a room where ample daylight is provided. The ventilation in this room is by windows and by skylight. They operate no machinery. The general sanitary conditions under which women work in this factory are good, and especial attention is invited to the conditions under which compressed tablets are prepared.

LXXIII. *Book and catalogue factory.*—This is located in a good brick building, which has a saw-tooth roof that admits an excellent north light. In the office where a number of girls work, the temperature was a bit too warm and the atmosphere close. There is ample window space, but the windows are not kept open. In the book and catalogue bindery women do not operate any machinery that is dangerous or that requires any great exertion. The condition of the

atmosphere seemed to be very good, except in the corner where the gluing process was carried on. In the pressroom the temperature was about 75° F., and the humidity rather low. This condition is necessary in order to keep the large pieces of paper from warping. The girls merely feed the press machines and sit while working. In the composing room exhaust fans and hoods are provided for removing the fumes that arise from the linotypes and other machines. Eight girls are engaged in proof reading in an adjoining room, and they stand at this work. The wooden floors are being replaced by cement floors. There are ventilating windows in the skylights, and the Sturtevant blower and heating system is installed. In its operation air is removed from one room, reheated, and discharged into another room. One object of this is to provide the desired low humidity in the pressroom, and one of the principal objects is fuel economy, as it requires less fuel to reheat air than to heat fresh air from the outside. The washing facilities consist of a number of faucets placed over a long trough. Roller towels and bar soap are provided for common use. The toilets are good. The lunch room, rest room, and recreation room are all good. Separate lockers are provided for cloaks. Attention is invited to the good washing facilities, and if individual towels and liquid soap were provided the plan would be the most desirable one. A recently installed mechanical filter has a device attached for disinfecting the filtered drinking water with ozone. It is planned to thus disinfect all drinking water and to keep it in buckets in different parts of the factory. All machinery is motor driven, and there are but few belts or exposed shafting. The clamping machines are not protected. The general sanitary conditions throughout this factory provide ample air space per employee, and, with the exception of the system of reheating air and the condition of the atmosphere in the office, are very good.

LXXIV. *Dry goods store.*—This is located in a large six-story brick building which is steam heated, electric lighted, and window ventilated. In the fourth-floor office the girl who operates a traveling cash-box machine has to stand against a steam radiator. The millinery repair room is partitioned off from the main room by 6-foot partitions. Foot-driven machines are used, and the light and air are good. In the alteration room, where 19 women work, there is a good skylight and the air space per employee is about 550 cubic feet. There are three windows and foot-driven sewing machines. The partitions making this room extend to the ceiling, and the only provision for ventilation is through the windows, which, according to the usual custom in such places, are kept closed, not by order of the management but by the majority rule of the occupants. Twelve girls work in the kitchen, which was rather hot and steamy. One girl was ironing a shirt waist on the kitchen table. The cubic air space per employee in the kitchen was abount 750. In the basement where women work ventilation is provided for by small windows that open about the level of the sidewalk and by the elevator shaft and stairway. There are no steam radiators in the basement. The approach to the fire escape on the upper floors is through windows which are about 4 feet above the floor. Roller towels for common use are supplied, and each girl is said to keep her own cake of soap in a box behind her counter. The sanitary conditions of the water-closets are good, and a "matron" is employed to look after the rest room for shoppers and the toilets. The floors in this as well as other department stores are cleaned by sweeping and mopping. The vacuum sweepers are not being used.

LXXV. *Cracker factory.*—This is in a brick building with good surroundings, which is steam heated and electric lighted. In the cracker department there is some flour dust in the atmosphere; but as the management requires care in emptying the sacks of flour, the amount of flour dust escaping is materially reduced. The floor is fairly clean. The ceiling ventilators in this room were closed, as were the windows. The icing and packing room was dark, especially

in the corner where two girls applied the coconut to the cakes. This, however, was lighted by an electric light. The work performed by these girls was feeding traveling belts, which enables them to sit most of the time. Cloaks are hung in the water-closet room, where the sanitary conditions are fair. There is a washbasin in this room, and the roller towel and bar soap are supplied for common use. The air space per employee throughout the factory is ample. There is an outside fire escape at the rear of the building, but there is no fire drill. The machinery operated by the girls is not dangerous and does not require any particular effort. Plans are being prepared for a new plant.

LXXVI. *Department store.*—This is a five-story brick building in good surroundings, electric lighted and steam heated, and a well-arranged fire stairway is inclosed in a brick well. The salesrooms are ventilated and heated by the Sturtevant blower and heating system, but the openings of the conduits are flush with the floor. The fresh air is drawn into the heating coils through a galvanized-iron pipe that opens above the roof of the building. The alteration room is formed by a 7-foot partition and has both motor and foot driven sewing machines and electric irons. A few small irons are heated on a gas plate and the fumes escape into the room. The millinery repair room is shut off from the main salesroom by a 7-foot partition through which there are two exits. Irons are heated on a gas plate. The dyeing process used in this room consists of spraying the dye on hats by the use of compressed air. These dyes are water soluble and the process appears to be an improvement on the old system of dipping. The kitchen range is hooded and has an exhaust fan for removing fumes. The lunch and cloak rooms on the fourth floor are good and there is a small sick and rest room near by for the use of employees. A first-aid cabinet is supplied. Washstands and a sanitary towel system are in use and it is planned to supply liquid soap for the use of employees. In summer small electric fans are said to be used in the alteration rooms. The washroom in the basement is supplied with a roller towel and cake of soap for common use. The provisions for fire escape from the basement consist of a ladder which extends from the floor to a small window near the ceiling of the basement and opening into the alley at the rear of the building. The stairway and elevator, of course, are also available. The air space per employee is ample. The general sanitary conditions in this store are good.

LXXVII. *Dry goods store.*—This occupies the ground floor in a brick building, which is electric lighted and steam heated. The air space per employee is ample. An **E**-shaped partition in the basement, about 8 feet high, incloses the water-closets for men and women. There is a washbasin, roller towel, and bar soap for the use of employees. No employees work in the basement. Ventilation in the salesroom is through the rear windows and front door.

LXXVIII. *Dry goods store.*—This store is located in a brick building, which is steam heated and electric lighted. The general conditions as to ventilation, heating, and lighting are similar to those in other department stores. In the millinery workroom, which is shut off from the main room by a 7-foot partition, four women work. This space is about 6 feet wide and 14 feet long, and it also has a large steam radiator, and a washstand fixture. In the repair department, which is partitioned off, there are five windows, all of which are closed, and motor-driven sewing machines have shafting which is not guarded. The roller towel, bar of soap, and common drinking glass are used by the employees. The approaches to the outside fire escape from the upper floors are through windows about 2½ feet from the floor. The irons in the repair department are heated on gas plates. The cloak lockers are in the basement, which is dark. Ventilation is provided for by windows, doors, and elevator shafts. There are no seats for saleswomen while not working. The air space per employee is ample.

LXXIX. *Garment factory.*—This is in a brick building. The shafting beneath the sewing machines used in sewing overalls is not protected except by cuffs of tin that revolve with the shafting, but not attached to it. Electric fans are placed on the line of sewing machines for use in summer. Lighting and ventilation are provided for by windows and skylights. The heating is by steam pipes. Artificial light is supplied by gas. The cloakroom is on a balcony in the main workroom. The roller towel, drinking cup, and bar soap are provided for common use. The sanitary conditions of the water-closets on the third floor are good, and a partition protects the approach to them. The approaches to the fire escape are through windows about 4 feet above the floor in the rear of the building and through doors at the front of the building. The air space per employee is ample, and the general sanitary conditions of the plant are fair.

LXXX. *Garment factory.*—This is in a three-story brick building in good surroundings. The line of shafting beneath the sewing machines, used in making overalls, is protected by a 6-inch guard board, and each machine has an electric drop-light. Girls who operate the button-fastening machines sit at their work and accomplish it without any special muscular effort. The machine appears to be guarded as well as practicable. Near by these machines a tin washbasin full of dirty water is kept on a wooden box along with a cake of soap and a common towel for use in washing. The sewing-machine shafting on the third floor is guarded by a 6-inch board and there are numerous skylights as well as side windows. None of the windows were open and the same condition of poor ventilation obtains here as in other places where the provisions for ventilation requires the attention of the occupants of the room. In summer small electric fans are placed on the workbenches for ventilation purposes. Girls eat lunch at their worktables. There is a small cloakroom partitioned off from the main workroom. The toilet facilities are fair. The air space per employee is ample, but, as in other overall factories, there is considerable noise and jarring produced in driving the machinery, as well as unavoidable lint. Electricity is used for lighting and driving the machinery. Adjoining this third-floor workroom four good washing basins and four roller towels are used by 150 girls. The workrooms are large and high studded. A tin cup is supplied for drinking purposes and the management supplies at cost hot coffee for the girls who take their lunch at the factory. The approaches to the rear outside fire escape are through windows about 2 feet above the floor, but steps are provided at each window. The sanitary conditions under which women work in the office are good.

LXXXI. *Enamel factory.*—This work is carried on in large brick buildings. The office, where clerical work is carried on by girls, has the indirect system of lighting, which evenly distributes a soft and sufficient light. The workrooms are ventilated and heated by the Sturtevant system and the practice of reheating air and discharging it into other rooms is in vogue. The main work floor is of cement, and there are numerous skylights. In the dipping room girls stand at work on a wooden floor dipping galvanized-iron pans into liquid enamel and spraying on the color. While this liquid enamel gets on the hands, I noticed none that were irritated, nor could I obtain a history of any such irritation. Occasionally, rough places on the pans would scratch the hands of the girls. In this room there were large monitors and the Sturtevant conduits distribute the air well. In the retinning plant tin tops are polished by hand and dipped in molten tin, which is done under a ventilating hood. In this process melted tallow is used, the odors from which were quite noticable. The wrapping room is on the fourth floor, where ventilation by windows is provided for and the room is heated by the Sturtevant system. The toilet and cloak facilities on this floor are small; no towels nor soap are supplied for

washing purposes. From this floor there is no external fire escape, but fire extinguishers and fire hose are provided and the inside fire-alarm system. Large fire doors shut off this room from other rooms. There is a lunch room but no rest room. The air space per employee throughout the factory is liberal and the ventilating and heating in the dipping room, where so many girls work, is very good, indeed, due principally to the operation of the large monitors. The working conditions here are good. Stools are provided upon which girls may sit when not actually at work, but the few girls who were resting were sitting on tables rather than on the stools.

LXXXII. *Store.*—This is located in a modern, reinforced-concrete outside brick building, with large workrooms, electric lighted, steam heated, and window ventilated. In the second floor sewing room the shafting below the sewing machines that are used in making Mackinaw coats, pants, overalls, etc., is protected by 6-inch guard boards. The shafting on three other lines of sewing machines in this same room, however, was not protected. The wooden floors are kept clean. There is a good sprinkler system installed. For drinking purposes the common dipper is supplied. The washing facilities consist of faucets over a long trough and the use of liquid soap. The cloakroom is supplied with forms upon which to hang cloaks. The toilet facilities are sanitary and in a space adjoining the toilets there is a bed for use in case of sickness. In the workrooms there are some indirect lights over which are placed large sheets of tin which serve as reflectors. These are necessary in view of the openwork of the ceiling. The A. D. T. inside fire-alarm system and a sprinkler system are installed. There is a good lunch and rest room in the basement. The general sanitary conditions in this plant are very good, but the machinery, of course, causes considerable noise and jarring, both of which are unavoidable.

LXXXIII. *Candy factory.*—This is in an old brick building. In the basement, where much of the work is done by girls, the light and air come through windows that open near the sidewalk. The basement is steam heated and has a cement floor. Girls sit at the work of chocolate dipping. Girls carry trays of chocolates, but these are not heavy. The washing facilities consist of a sink, roller towel, and bar soap, and a cup is provided for drinking purposes. Cloaks are hung on pegs in a small room off from the water closet, in which there is one seat. In case of fire, escape from this basement would be along the narrow stairway leading to the main floor. There is a small door where the cloaks are hung, which is provided as a safety door in case of fire. To open it, it is necessary to smash a pane of glass to get at the door knob and lock. This opens on the outside. There are very narrow steps which lead from the basement floor to the "balcony" on which the cloaks and water closet are situated. On the second floor three to six girls are engaged in coating candy. There is considerable dust from starch and sugar in the air and on the floor of this work room, which is electric lighted. The machinery is steam heated and the room is hot and the steam kettles give off considerable steam. On this floor there is a small closet for hanging cloaks and for toilet purposes, the sanitary conditions of which are fair. The washing facilities consist of a sink, bar soap, paper towels, and roller towels. On the third floor from 50 to 100 girls, according to requirements, are engaged in wrapping and packing candy. The air space per employee in this room, which measures 60 by 40 by 8, varies with the number of employees. On this floor there is a new sink, roller towels, and cake of soap, for washing purposes, and a small closet for cloaks and toilet purposes. The room is steam heated and the floor dirty. In the box-making department, which is in a separate building, one girl sits to operate the corner-staying machine and wears steel finger thimbles as a protection against injury from the machine. In the fancy box-making room the atmosphere is close and decidedly foul as a result of closed windows

and large open pots of soured glue. The water closets for the use of girls working in this building are quite dirty. The general sanitary conditions of this factory need decided improvement in several respects, the management not appearing to appreciate the fact that good hygienic conditions enable workers to do better work.

LXXXIV. *Dry goods store.*—This is located in a brick building. The entire inside of this building is unusually well lighted by a roof monitor, and the general sanitary conditions in the salesrooms are good. On the second floor there is a lunch room containing one round table and six chairs. This is a small, partitioned-off space. In the dressmaking room sewing machines are motor and foot driven. This room, which is steam heated, is partitioned off from the main salesroom. Irons used in pressing are heated over gas flames, and the resulting fumes escape into the room. The air space per employee is adequate. The fire escape from this room is reached through a window, which is about 2½ feet above the floor. The washing facilities consist of a faucet and roller towels. Cups are used for drinking purposes. There are sufficient electric lights and daylight. In the corset-alteration department one girl sits close by a steam radiator. This is a small space, but the partition does not extend to the ceiling. The millinery room is formed by an 8-foot partition, and has one window. Four women work in this department. Eight to ten women work in the alteration department, which is partitioned off, the partition being about 8 feet high. The sewing machines are foot driven. The room is steam heated and electric lighted. There are four windows, and irons are heated over a gas range in the usual way. Bar soap and a towel are provided for washing purposes. The inspection and wrapping department is located in a balcony on the main floor. The atmosphere is close, and there is a distinct odor of perspiration. As is customary on such balconies, the ventilation is poor. In the basement ventilation is provided for by window pits, the elevator shaft, and stairway. Cloak lockers are in the basement. The floor is of wood, and in places quite uneven. It is electric lighted and steam heated. The air space per employee in this store is adequate, and especial attention is invited to the excellent provision for admitting daylight.

LXXXV. *Store.*—This occupies the main floor and basement of a good brick building. From the basement a door leads to an outside concrete stairway to the sidewalk, which is a suitable escape in case of fire. The floor is of cement. Transom windows open near the sidewalk. There is fairly good daylight and electric light. Cloaks are hung on pegs in stalls in the stock room of the basement. A cake of soap and roller towel are supplied for common use. On the main floor the water closet is used for men and women and has only one seat. The sanitary conditions of it are good. The main salesroom is ventilated by windows, and is steam heated and electric lighted. The atmosphere at the time of my visit was fairly good. The air space per employee is ample, and the floors are kept clean.

LXXXVI. *Store.*—This is in a large brick building, the front half of which is four stories high while the rear is only one story high. The salesroom on the main floor has several skylight monitors for lighting and ventilation purposes, and the general sanitary conditions on this floor are good. This is a department store. On the second floor two women work in the alteration department, which is partitioned off from the main room, according to the general practice, and there is a radiator in this department. The machines are driven by foot. In the basement there are small transom windows about the level of the sidewalk which are fixed and can not be opened for ventilating purposes but do admit some daylight, as do the several window pits. The windows in these pits were closed. The sanitary condition of the two-seated water-closet is good. The floor is of cement and connected by a trap with the sewer, and the room is

well lighted. Roller towels and a common cake of soap are provided. The fire escape from the basement is along the wooden stairway. In the basement and on the main floor both gas and electric lights are used, which is a good provision, as electric lights do not always work.

LXXXVII. *Garment factory.*—The main floor of this brick building is used for a salesroom about 120 by 19 by 18. The air space per employee is ample and the ceiling has one skylight. On this floor is a small water-closet, which is used by men and women. Washing facilities consist of a roller towel and bar soap. The place is steam heated and electric lighted. There are not sufficient provisions for ventilation, as this is a long, narrow room. On the second floor forward four women are engaged in making alterations. The workers have good daylight through three large bay windows, all of which, however, were closed. This floor is heated by hot water and supplied with gaslight. These workers are at liberty to eat their lunch in this room. Pressing irons are heated at the rear of this long room on a gas stove.

LXXXVIII. This overall factory occupies the second and third floors of an old brick building. The second floor is reached by a narrow stairway leading from the sidewalk. On this floor the cloaks of workers are hung on pegs in a place partitioned off from the main workroom. Washing facilities consist of bar soap, roller towels, and a faucet. The room is electric lighted and heated by two coal stoves, the heat from which is particularly excessive for the workers nearest them and entirely too much for the entire room. On the third floor the workroom is long and narrow, being about 90 by 17 by 12. There are two small skylights and windows forward and aft. Eighteen girls and two men work in this room, which is also heated by two coal stoves, near which some of the workers have to sit. The shafting of the sewing machines is protected in places by a 6-inch guard board, while in other places there is no protection. The fire escape can be reached through the rear windows of these rooms. Two small skylights and the three windows forward and three aft are the only provisions for ventilation, and these appear to have been closed up for the winter. The daylight was not very good, and three girls were using electric drop lights. The general sanitary conditions under which women have to work in this factory need considerable improvement.

LXXXIX. *Shirt factory.*—This occupies the ground floor of a brick building, the workroom measuring 75 by 20 by 20. Twenty-four girls work here on motor-driven sewing machines, the shafting of which is protected by a 6-inch guard board. This room is heated by a coal stove, but was not overheated. At the end of the line of sewing machines is a small gas-heated steam producer for use in steaming shirtwaists, preparatory to pressing them with a gas-heated iron. This heater is not hooded, and much of the steam escapes into the room. Ventilation is provided for by windows and doors, which, according to the prevailing custom, are kept closed. The washing facilities consist of a roller towel, sink, and a bar of soap. The sanitary condition of the water-closet is good.

XC. *Cigar factory.*—This is located in a large, modern, reinforced-concrete building, which is provided with steam heat, electric light, adequate fire escapes, wash rooms, cloak racks, and water-closets. The general sanitary conditions throughout the plant are in all respects good. There are suitable washing facilities, but no soap is supplied. Each girl has her own towel, which she keeps at her work table. The air space per employee is very liberal. The floors are of wood and are kept clean. The work benches are good, as are the chairs. On the third floor there is a sick room for emergency use, and its sanitary condition is good. The cloak racks are made of iron piping suspended from the ceiling in each workroom. The sanitary advantages of this plan are superior to the individual lockers, as there is no possibility for the collec-

tion of dirt, insects, etc. Only four women work in the sweating room, and then only for a short time each day. The sweating room is provided with good exhaust fans, which are thoroughly operated before the women go into the room and during their stay in it. The ventilation in all the other workrooms where women are employed is provided for by windows and doors. The odor of tobacco is unavoidably present in all of the workrooms, as it is essential to keep the tobacco moist while it is being worked up. In respect to the water-closets of women, there are a large number of seats placed in a large, well-lighted room, but these seats are all open, there being no partitions separating them. From the viewpoint of sanitation, this arrangement is good.

XCI: *Overall factory.*—This is located in an old two-story frame building in good surroundings. The top-floor workroom is 100 by 50 by 12 feet and provides ample space for the 30 to 50 girls who work in it. The room is electric lighted and heated by two coal stoves. Six-inch guard boards protect the shafting of the motor-driven sewing machines. Electric fans are provided for use in summer. At the rear there is an outside wooden fire escape, the approach to which is not obstructed. The ventilation is good and is provided for by windows and the cracks in the building. It seemed to be adequately heated. The washing facilities consist of a sink, bar of soap, and roller towel for common use. Drinking water is kept in coolers, and cups are used for drinking purposes. There is no lunch nor rest room. The women who work in the office on the first floor do so under fairly good sanitary conditions. The water-closet facilities are fair.

XCII. *Buggy factory.*—This is in a large brick building in good surroundings. Outside of the offices women work in the trimming shop only. The air space per employee is ample. Ventilation and daylight is provided for by windows and a large monitor which runs the length of the room. The room is electric lighted and steam heated. Most of the girls stand at work. Some of them are engaged in pasting on quarters and back stays, using a paste said to contain carbolic acid as a preservative. This paste is spread on by the ungloved hand. A few girls are engaged in punching straps, for which purpose they use a steel punch and a fairly heavy mallet. Some of the mallets are heavier than others, but the girls using them seem to have no objection to their weight. The sewing-machine shafting, which is motor driven, has no guardrail, but it is well removed from the skirts of the sewing-machine workers. The floors on which the women stand are of wood. The cloaks are hung on pegs in a small room near by. Some girls are engaged in driving small steel tacks to hold the facings of cushions, using small tack hammers for this purpose. These hammers weigh about 7 ounces. In the process of head lining the girls also drive tacks. To expedite this work the girls hold the tacks in their mouths. It is said that occasionally a girl swallows a tack, but that no harm results. In making top pads girls stuff excelsior into the leather pads, using their hands and a turntable, which is easily operated. The fire escape from the third floor is by an inside stairway and across an iron bridge leading to an adjoining building. Fire extinguishers are kept throughout the room and the A. D. T. inside alarm system is installed. In the main office, where 35 girls work, the indirect system of lighting is used and the general sanitary conditions are good. They have a suitable cloakroom. In the superintendent's office 10 girls work under good conditions. The fumes from the painting room and assembling room where men only work do not seem to invade the superintendent's office, which is near by. The company does not supply towels nor soap for washing purposes and tin cups are provided for drinking purposes. The toilet facilities are sanitary, and there is a lounge in the cloakroom for the shop girls.

XCIII. *Pottery.*—This work is carried on in a large brick building, with good surroundings. In the decorating department on the third floor where 12

are superior to the individual lockers, as there is no possibility for the collec-

girls work the air space is ample and the ventilation through windows is fairly good. The room is steam heated and electric lighted, and there are good wooden floors. A hardwood varnish is applied to the plates preparatory to applying the transfer paper, which is stuck to the plate by the use of a bristle brush and water. Some of the girls stand and some of them sit at this work. Cloaks are hung in a partitioned-off space adjoining the water-closets, which are sanitary. Girls apply the gilt to crockery with brushes, and for this work they have comfortable seats and good light. In this same room a man is engaged in spraying tint on pitchers. This is done under an exhaust hood horizontally placed and quite adequate for removing the excess tint solution. A girl is used for stamping figures on plates, using a stamp pad and stamp. This is rapid work and requires the constant use of the right arm. The girl sits at this work. The girls supply their own towels and soap, but there is a sink at which they may wash. There are no lunch nor rest rooms. Girls also supply their own work aprons. From this floor there is an outside fire escape easily approached, and the A. D. T. inside fire-signal system is installed. In the basement, the floor of which is cemented, nine girls are engaged in chipping off small, rough knobs from the recently baked chinaware. In this they use small steel chisels and sit at the work. This process makes some dust, and it is possible that small pieces of china may fly into the face of the worker. None of the girls, however, said that they had been troubled by this work. The rough bottoms of cups are polished with small pieces of steel and with a piece of carborundum. This also creates some dust, but none of the workers have ever found it necessary to protect their eyes from it. In the dipping room, which is also in the basement, or rather, on the ground floor, six women are engaged in dipping the ware into the liquid glaze. Some of this glaze gets on the hands, but they do not use gloves. After the cups have been dipped they are placed on racks and a small girl removes the excess of glaze from the bottoms of the cups by the use of a sponge. When these racks are filled this small girl has to lift them and stack them up on a table. It would seem that this work is rather heavy for this child. After the first firing of the plates girls remove the sand from them with sandpaper and brush them off with hair brushes. In doing this they use cloth finger guards. The general sanitary conditions in this pottery are good and no women are exposed to any particular danger.

XCIV. *Cotton mills.*—This is located in a large stone building in good surroundings. The general sanitary conditions under which women work are good, but as in all cotton mills they are unavoidably exposed to the noise and jarring of the machinery and to the lint that escapes into the workrooms during the process of manufacture. These workrooms are long and narrow and are well lighted by numerous windows opening into them. The system of ventilation and humidifying is scientific and well regulated. Fresh air is washed and humidified and delivered to the several workrooms as required by the system. The temperature is comfortable and in none of the rooms did the humidity appear to be excessive. The machinery is adequately safeguarded and easily operated. The wooden floors are in good condition and are kept reasonably clean during working hours. The toilet facilities are sanitary. There are no lunch nor rest rooms, but most of the workers go home for their midday meal. In the final inspection room the Cooper-Hewitt light is provided, and the light is evenly distributed and sufficient. The air space per employee in this factory is liberal. Especial attention is invited to the fact that the ventilation and heating system supplies fresh air continually to the workers. This is a noticeable contrast to the practice of reheating used air and pumping it back into the workrooms.

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